Mayah®

Communications

Merk II

Audio Codec/Mixer

User Manual

Order-No. MHH001-1

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1 Introduction

The devices of the CENTAURI series are audio gateways; in other words they are audio codecs with extensive network ability (Internet, Intranet, LAN, WAN). They support all common coding procedures and transmission protocols.

1.1. Overview

The new MAYAH MERK II is a portable Codec and Mixer. It is based on the well known and introduced CENTAURI product family. While typical portable devices have restrictions on the number of audio I/O and compatibility, the MERK II development has focussed on extended features and functionality in that area:

4 switchable MIC/LINE Inputs, 2 Line Inputs and 4 Headphone Outputs

Switchable Phantom Power 48V with LED indication

10/100 Mbit/s Ethernet for Audio-via-IP and Wireless-LAN

Extended mixing capabilitites including monitor & control

Flashcast compatibility to most of all available audio codecs

Extremely low delay algorithms with apt-X, ADPCM4SB and AAC Low Delay

Electronically controlled potentiometers for full audio mixing remote control

Figure 1: *Merk II Portable Audio Codec/Mixer*

MERK II supports dual codec mode as well as point-to-multipoint transmissions – the dream of a reporter to reach up to 8 destinations simultaneously with e.g. 64kBit/s AAC audio quality. Up to four people for extended interview groups or a combination of original stadium sound plus two interview people can be transmitted simultaneously in stereo with all mixing parameters under control. Individually controllable send/receive levels for headphone monitoring allow the right mix for each interview partner.
With Flashcast® technology connectivity is as easy as pushing a button. Directories of complete set-ups and phone book entries are easy to access. Compatibility to many available audio codecs is provided in the same and known professionalism as in CENTAURI® Audio Gateway Codecs. Ergonomic studies have resulted in control and LCD combination in a user friendly way. The eight keypotentiometers are electronically controlled and are either level, pan or gain. The selection is performed by four function keys. The traditional keypad from CENTAURI for navigation and alphanumeric processes is kept.

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1.2. Merk II Features

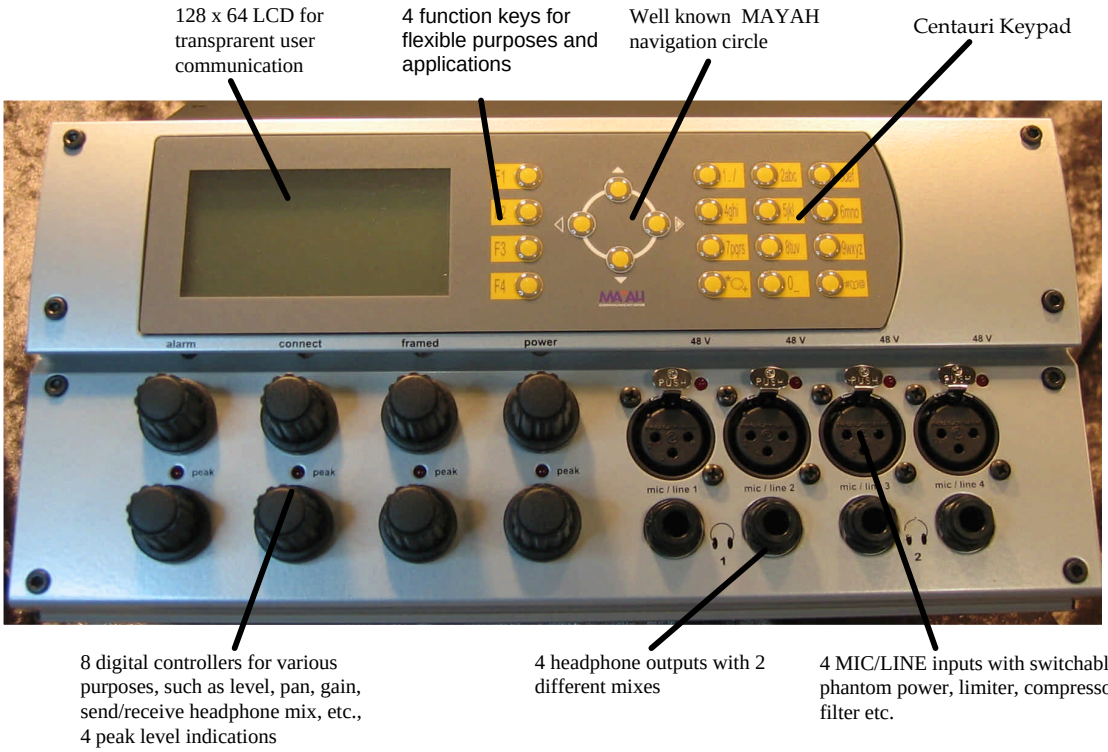

128 x 64 LCD for transprarent user communication
4 function keys for flexible purposes and applications
Well known MAYAH navigation circle
Centauri Keypad
alarm
connect
framed
power
48 V
peak
mic / line 1
mic / line 2
mic / line 4
8 digital controllers for various purposes, such as level, pan, gain, send/receive headphone mix, etc., 4 peak level indications
4 headphone outputs with 2 different mixes
4 MIC/LINE inputs with switchable phantom power, limiter, compressor, filter etc.

Figure 2: *Merk II Features*

The new Merk II Portable Audio Codec/Mixer consists in part of well known components of the Centauri family.

- The 128x64 LCD Centauri Frontpanel visualizes the menu and shows all possible settings
- The Mayah Navigation Circle provides an easy way of navigating through the menu structure
- The Centauri Keypad consists of alphanumeric keys which partly have an additional speed dial function
- 4 Function Keys provide the possibility to choose different functions for the controllers
- 8 controllers are for adjusting the preselected function
- 4 Microphone/Line Inputs on the front and 2 Line Inputs on the rear
- 4 Headphone Outputs with 2 different mixes
- 2 Line Out/Monitor XLR-Outputs on the rear (see Figure 12)

1.2.1. The Function Keys

Each function key shows a different screen on the frontpanel and preselects the adjustable settings for the 8 controllers.

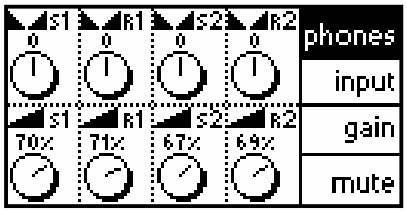
F1: Phones-Screen

F2: Input-Screen (optionally *front* or *rear*, indicated as long as the function key is pressed)

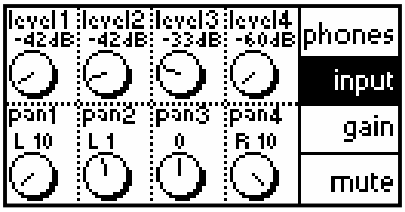
F3: Gain-Screen

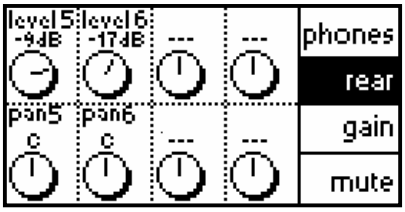
F4: Mute-Screen

- F1: Phones-Screen

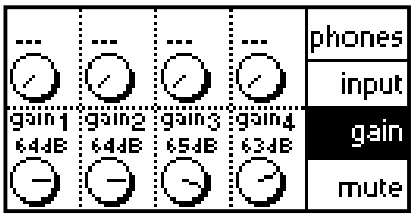


- F2: Input-Screen (optionally *front* or *rear*, indicated as long as the function key is pressed)

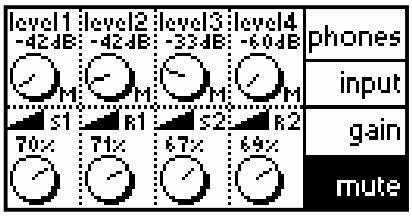




- F3: Gain-Screen



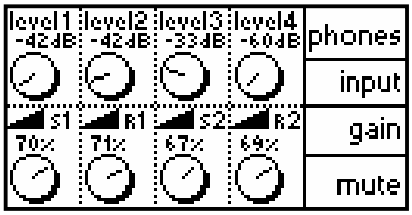
- F4: Mute-Screen



NOTE: The 4 red peak-LEDs, each for every input channel on the front side, are only relevant while operating with microphones! They will be lit, if an overmodulation of the A/D-converter occurs. In this case the gain of the entrance amplifier has to be lowered until the LED expires.
During LINE-operation the red LED will only be lit, if the headroom of 18 dBu is used to full capacity. The entrance level then has to be lowered accordingly, since the Merk II doesn't feature a potentiometer in front of the A/D-converter.

Additionally there is one popup-screen which appears if one of the controllers is turned during the normal menu display of the frontpanel. This popup-screen will automatically disappear again after a specific time-period.

- Popup-Screen



Note: It is possible to control and change all settings made with function-keys and controllers ex post in the studio which makes an error correction available.

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The block diagram shows how the Merk II works:

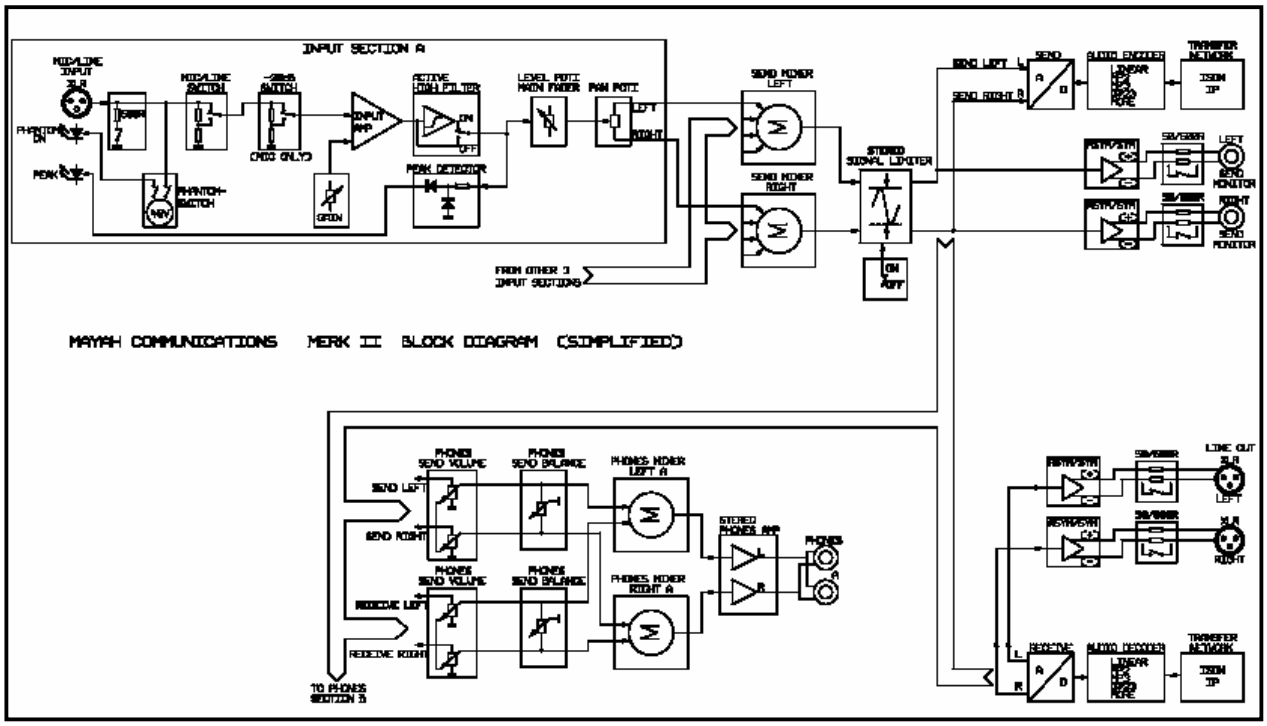

Figure 3: *Merk II block diagram*

Event-dependent Control

CENTAURI Gateways can be programmed such that they react to particular, pre-determined events in a set way. Events can thus be linked with actions.

The event-dependent control is described in the Centauri Communication Reference Manual and several Application Notes. Please take note of our notifications (also in the Internet under http://www.mayah.com).

1.3. First Steps / Quick Start

The Merk II Portable Audio Codec/Mixer has a display and a keyboard on the front of the device. You can therefore set up a connection to another communication partner immediately as soon as you have unpacked such a device and connected it up to the mains and ISDN.

> *The information shown on the display of the Merk II can appear in different languages (can be pre-set, see* section *"Set Display Language"). On delivery the devices are set to the English language. This is why all the corresponding illustrations in this handbook show the English language display.*

To set up an immediate connection, proceed as follows:

- Switch on the device. The switch is to be found on the rear of the device (see Figure 12). After a short time the MERK II start mask appears on the Display:

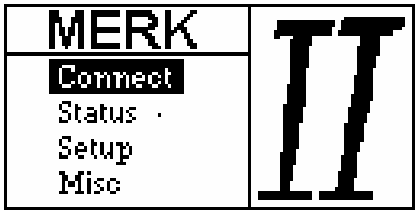

Figure 4: *The MERK II Start Mask*

- Select CONNECT with the arrow key and press .The Connect Dialog will now appear on the display:

Figure 5: *Connect Dialog Mask*

There are already entries with test numbers entered in the phone book when the device leaves the works.

- If you want to try out one of the available test numbers, select PHONEBOOK and press . A list will then appear showing all the entries set at the works.
- Select one of the phone book entries with the and keys and press . The device then immediately begins to create a connection to the selected number.

You can also enter an ISDN phone number manually and then set up a connection to the same number. This can be any ISDN phone number.

- To set up an immediate connection to a new subscriber, select DIRECT DIAL and press . Only one input request for the new ISDN phone number appears on the display.
- Press , use the number keys to enter the number for DEST.1 and the press . again.
- If required set DEST. 2 and enter the second number in the same manner.
- Select CONNECT!. The device now immediately starts to set up a connection to the numbers entered.

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In both cases you can follow the establishment of the connection on the display or in the program window:

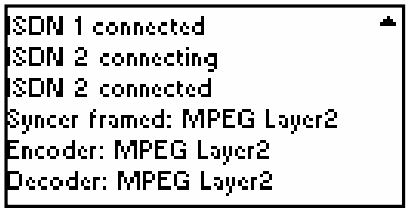

Figure 6: *Establishing a connection*

If the establishment of the connection is successful, the device automatically synchronizes itself with the partner at the other end of the line. If speakers are connected to the device, you too can hear the audio signal from the other end. The LC Display also jumps to the Status Dialog (see Figure 69) and displays the level of the in and out signal.

If the establishment of the connection has been successful, the device switches back to the mask that was displayed beforehand.

If the connection cannot be established, please check the following:

- Does the ISDN setting correspond to the existing ISDN (see section "Configure ISDN-Adapter")?
- Is the device connected to an extension number meaning that it is necessary to dial a number (e.g. zero) to get an outside line before a connection can be made (see section "Configure ISDN-Adapter")?

If an arrow pointing up and/or down ⇕ appears in a display, there are then other lines above or below the lines shown that you can shift up or down using ▲ and ▼ and then bring onto the display.

1.4. Controls on the Device

1.4.1. Switching On and Off

All Merk II is switched on and off at the rear of the device (see Figure 12).

After switching on and in rest mode the display (only available on the 2001/3001) shows the start mask (see Figure 4).

1.4.2. Controlling using the Front Keys

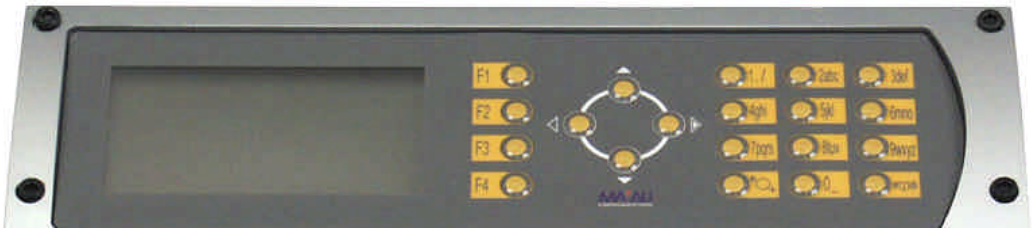

Figure 7: *Merk II control elements*

Despite the 4 function keys which are explained in chapter 1.2.1, the Merk II has an LC display on the front of the device with a resolution of 128 x 64 pixels, control keys arranged in a ring and a 3-x-4 letter and number keyboard. The device can be controlled using these elements. The key configuration is as follows:

0-9,#,*	Numbers 0-9 and letters if permitted (press respective key several times if necessary); For example, by repeatedly pressing the ‚2' key the sequence: ‚2' ‚A' ‚a' ‚B' ‚b' ‚C' ‚c' ‚2' etc. is generated) Special Key Functions: If a list containing several elements appears at the display, skip to the top of the list by pressing “1”, or to the bottom by pressing “9”. Speed dialling by means of abbreviated numbers is managed with the and keys. See details on page 55.
▲ ▼	Move the cursor to the left or the right; In a list: move upwards or downwards; Keys have an automatic repeat function; keeping one of the keys depressed moves the cursor back and forth or up and down;
◁	In a list: leave list without activating (cancel dialog, escape function); In an entry to be changed with number or character: delete character on the cursor
▷	In a list: select entry: otherwise: complete entry, close text output mask.

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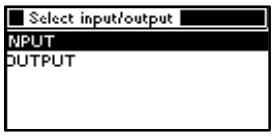
1.4.3. Mask Display and Key Controls

The mask representation and key controls follow the following rules:

1)

2) 

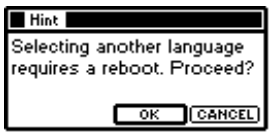
3) 

Figure 8: *Mask display*

The mask title is top left (in Figure 11[1)]: “Analog Levels”). It is shown inverse. The action description is found to the right of the mask title. In Figure 11 [1)] the request is `SELECT ITEM`, since no selection has been made. As soon as one of the list items is selected with the arrow keys and activated by pressing , its name appears in the mask top right (see Figure 11 [2)]). This list item now reacts to the key input. In order to leave this list item and save the setting made, one must press .

After pressing the key in phone book or communication profile, the `OK` or `CANCEL` dialogs appear. In this the OK icon is pre-selected and furnished with a thicker outline (see Figure 11[3)]). Pressing the key again gives positive confirmation of the whole dialog in this case.
In all other dialogs the (also altered) setting is immediately taken over from the dialog with .

If in the case of phone book or communication profile dialogs you leave the dialog without making any changes, i.e. you want to quit the dialog, then press and select the Cancel icon. When you now press , the dialog is closed without being saved or changed. To cancel all other dialogs it is sufficient to press .

If an arrow pointing up and/or down appears in a display, there are then other lines above or below the lines shown that you can shift up or down using and and then bring onto the display.

1.4.4. Set-up Dialog Selection

After you have selected SETUP and pressed , the Setup appears. In the Setup Merk II offer the following dialog selections:

- New Phonebook Entry (see section “CreateEntry”)
- Edit Phonebook Entry (see section "Edit Entry")
- Delete Phonebook Entry (see section "Delete Entry")
- Input (see section "Set sources for the input channels")
- Microphone Settings (see section “Microphone Settings”)
- Line In (see section “Line In Settings”)
- Line Out (see section "Line Out Settings")
- Headphone (see section "Headphone")
- Mute (see section "Set Mute")
- Mixer Profiles (see section "Mixer Profiles")
- Audio Encoder (see section "Set Encoder ")
- Audio Decoder (see section “Set Decoder”)
- Timeouts (see section "Set Time Limit (Timeout)")
- Communication Interface (see section "Set Device Address")
- ISDN (see section "Configure ISDN Adapter")
- Network (see section “ Set Device Address")
- New Profile Entry (see section "Compile and Save Communication Profiles")
- Edit Profile Entry (see section “Edit Entry")
- Delete Profile Entry (see section "Delete communication profile")
- Date & Time (see section “Set Time, Date and Date Format")
- Front Panel (see section "Set Display Contrast/Background Lighting")
- Identification (see section “ Technical Data")
- Ancillary (see section “Set Communication Basic Conditions")
- Security (see section "ISDN Service Protection")
- Miscellaneous (see section "Set Quantization Procedure for G.711")

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1.5. Remote Control using Software

The Merk II can be remote-controlled using a PC with the Windows 95/ 98/ME/ NT/2000 operating systems. For this purpose special PC remote control software is included in the scope of delivery.

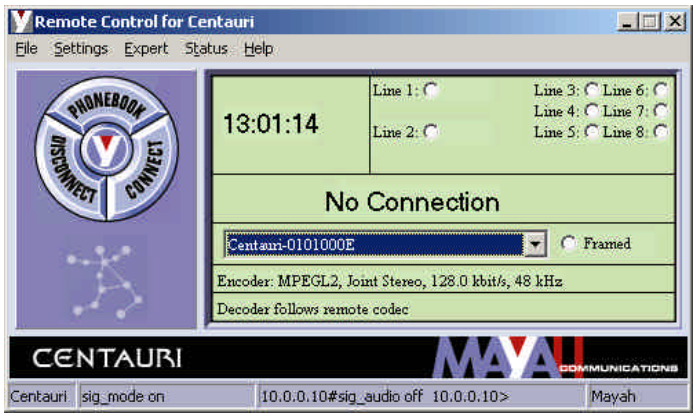

Figure 9: *The main window of the MERK II remote control software*

There must be a connection between PC and MERK II – either via a serial RS232-interface or via Internet Protocol (IP).

1.5.1. Remote Control via RS232 Interface

The following are required for remote-controlling the MERK II via a serial RS232 interface:

- PC with RS232 interface
- 9-pole zero modem cable (included in scope of delivery)

The MERK II RS232 interface uses the following parameters:

- Baud rate: 9600, 19200, 38400 (delivery condition) 57600, 115200
- Data bits: 8
- Stop bits: 1
- Parity: none
- Protocol: none

At the first Start the remote control software scans by default serial port 1 automatically (works settings). If the MERK II is controlled by one of the serial interfaces 2 to 8, the number of the ports to be scanned must be increased in the remote control menu item EXPERT OPTIONS correspondingly.

1.5.2. Remote Control via IP

The Merk II can also be remote-controlled via the network interface card via Internet Protocol. For this it must simply be started on any PC within the network and the network address or the name of the MERK II must be entered. The remote control software then creates a Windows socket connection to the MERK II via Internet Protocol.

The following is needed for remote-controlling the MERK II via IP:

- PC with 10 Mbit/s or 100 Mbit/s Ethernet
- IP protocol installed
- IP network and normal RJ45 network cable

For controlling via IP, the MERK II must be given a free IP address that corresponds to the sub-network mask of your network. Where larger networks are concerned the user should in all events contact the network administrator.

Example for assigning an IP Address:

A MERK II should be operated on a network where the following applies:

- The IP Addresses 192.168.1.0 to 192.168.1.100 have already been assigned
- The sub-network mask is 255.255.255.0
- The Merk II should contain IP Address 192. 168.1.101

Steps for the Merk II

- Set SETUP NETWORK ADDRESS on the front of the device and then enter '192.168.1.101'.
- Boot the Merk II anew (switch off and then on again)

Enter MERK II for Controlling via IP

- In order to enter a MERK II in the remote control software, select SETTINGS REMOTE SETTINGS (manual). The following dialog window opens:

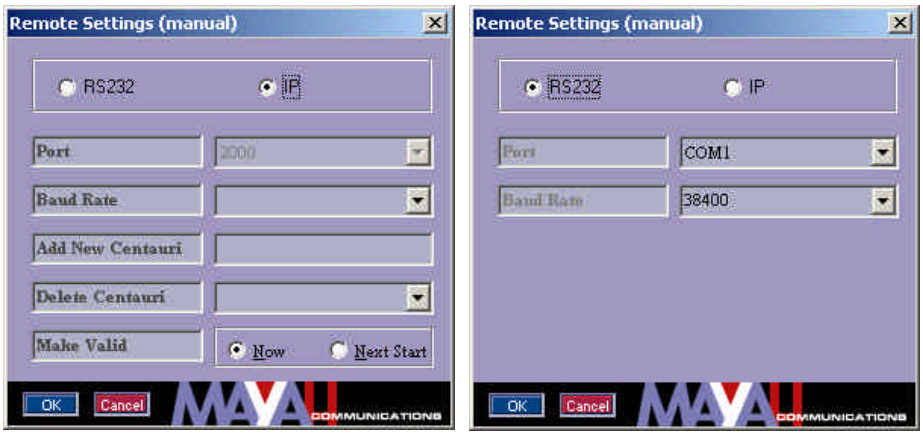

Figure 10: *Setting the MERK II remote control via IP or RS232*

- Click on ”IP” and enter the IP Address of the MERK II that is to be controlled with the software under ”Add New MERK II”.

  Port 2000 has nothing to do with Port 2001 that has been entered in the MERK II under ”Network”! Changing one of these two or both values results in communication problems!

- So that the entries are effective, click on ”OK”.

  Difference between 'Now' and 'Next Start':
  - In the case of 'Now' the connection to the given IP Address is activated immediate

  - In the case of 'Next Start' the connection to the given IP Address is first valid the next time the remote control software is started.
  Advantage:
  If the current stage of the remote control software is not closed and the remote control software started again with a new IP Address, several MERK IIs can be controlled simultaneously.

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1.5.3. Automatic UDP-Scan

- With selecting `SETTINGS REMOTE SETTINGS (automatical)` it is possible to examine the LAN or the serial interfaces for other Merk IIs. The following dialog window opens:

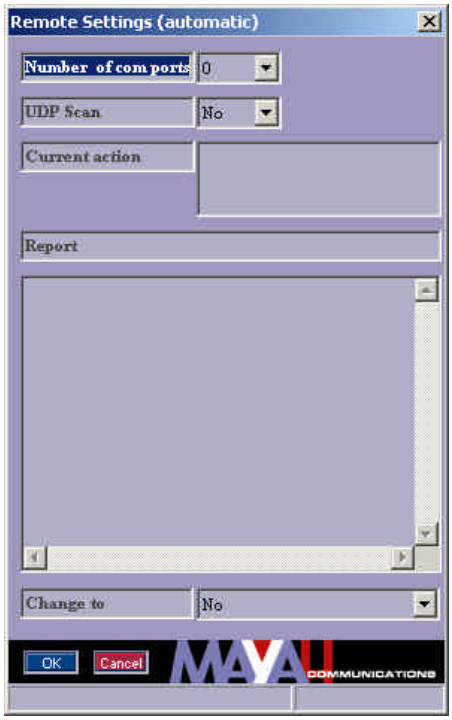

Figure 11: *Automatic UDP-Scan*

- Enter the `Number of com ports` for setting the number of serial interfaces that are to be examined or
- Select `UDP Scan` 'Yes' for scanning the LAN for other Merk IIs.
- Click on 'OK' for activating the scan.

The current action is displayed during the scan, e.g. '`Try Com Port 1 at baud rate 9600'`.

All found Merk IIs are listed below with information about number of comport, baudrate and Merk II name/serial number in case of scanning serial interfaces or IP-address and Merk II name/serial number in case of scanning the LAN.

2 Installation

2.1. Scope of Delivery

- **1** Merk II
- 1 Zero modem cable for remote control
- 1 mains cable (suitable for the country concerned)
- optional: 1 ISDN cable per ISDN line
- 1 CD
- this handbook

2.2. Environment and Operating Conditions

Attention!
Do not subject the device to damp (e.g. proximity to humidifiers etc.), heat (e.g. proximity to radiators, direct sunlight) or mechanical stress (e.g. shaking)!
Make sure that the ventilation openings of the device are not obstructed when the device is in operation, so that the air exchange necessary for the cooling of the device is not hindered!

The detailed environment and operating conditions are to be found in the chapter "Technical Data" .

2.3. Connections

Figure 12: *Plug-in field Merk II (rear side)*

2.4. Program Installation

To install the remote control software, start “SETUP.exe” in the software list on the CD-ROM supplied and follow the installation program instructions.

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2.5. Start Remote Control Software

- To start the remote control software, click on the program icon or double-click on the name of the program file in the program list in Explorer.

The remote control program automatically starts the COM interface after it is called up. If a Merk II is connected to one of the COM interfaces, the program recognizes the gateway and synchronizes itself with it automatically.

2.6. Control Remote Control Software via the Keyboard using Speed Dialling

As an alternative to controlling using the mouse, most of the CENTAURI remote control software functions can also be controlled using the keyboard. Here an overview:

Key	**Effect**
<ALT> + <letter>	Select the appropriate menu option
Main window	
p	Opens the Phonebook the same as clicking on the ”Phonebook ” switch with the mouse;
c	Opens the ”Connect” dialog window the same as clicking on the ”Connect” switch with the mouse;
m	Calls the Mayah Homepage; is the same as clicking on the central switch surface with the mouse;
End	Ends the MERK II’s current connection; is the same as clicking on the ”Disconnect” switch with the mouse;
All dialogs	
Enter	Is the same as mouse-clicking on ”OK”;
Escape	Is the same as mouse-clicking on ”Cancel”:
Phonebook dialog	
E	For editing an entry in Phone book; corresponds to double-clicking on a Phonebook entry with the mouse;
Enter	Uses the Phonebook entry selected at that particular moment; corresponds to clicking on the ”Connect” switch with the mouse;
Delete	Deletes the Phonebook entry selected at that particular moment; corresponds to clicking on ”DEL” with the mouse;
Insert	Creates a new Phonebook entry; corresponds to clicking on ”New” with the mouse;
Profile dialog in the <Expert/profiles> menu	
E	For editing the profile selected at that particular moment; corresponds to double-clicking on a profile with the mouse;
Delete	Deletes the profile selected at that particular moment; corresponds to double-clicking on ”DEL” with the mouse;
Insert	Creates a new profile; corresponds to double-clicking on ”New” with the mouse;

You can find more detailed information in the appropriate sections of this handbook.

2.7. Exit Program

To exit the program, click on or select FILE EXIT.

3 Basic settings

3.1. Set Display Language

The displays on the Merk II Audio Codec/Mixer can appear in various languages. On delivery the devices are set to English. This is why all the respective illustrations in this handbook show the display in English.

The language used in the display can be set using the keys on the front of the housing:

- Select the SETUP option in the start mask (see Figure 4). The Setup mask appears.
- Select MISCELLANEOUS. The following mask appears:

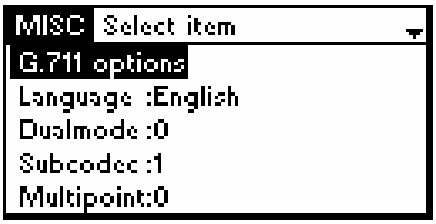

Figure 13: *The MISCELLANEOUS mask*

- Select the LANGUAGE line with the ▼ key and press ▶.
- Confirm the restart report and press ▶ again. The selection of the possible languages appears.
- Select the desired language with the ▲ or the ▼ key and press ▶ again.

The device starts again (”Reboot”). After this the information shown in the display will be in the selected language.

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3.2. Set Time, Date and Date Format

CENTAURI Gateways have an internal clock that is supplied with a battery in the event of a power cut etc. This is why it is only rarely necessary to set the internal clock.

To set the Merk II's internal clock and/or date and/or the format for time displays, proceed as follows:

a) Via the front panel:

- Select the SETUP option in the start mask (see Figure 4). The Setup mask appears.
- Select DATE & TIME. The following mask appears:

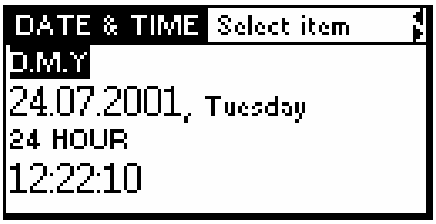

Figure 14: *The DATE & TIME mask*

The abbreviations in the mask have the following meanings:

- Y-M-D = Year, Month, Day (format can be sorted)
- D-M-Y = Day, Month, Year (Germany)
- M-D-Y = Month, Day, Year (US format)

- Set the desired information with the ▶, ▲ and ▼ keys and the number/letter keys.
- To close and save press ◀.

The time and date format set here affects the display in the journal. The time and date information in the journal is shown in the format set here.

a) Via the remote software:

- Select STATUS CENTAURI TIME;
- Set the desired time and date with the mouse;
- Click on OK;

3.3. Set Display Contrast/Background Lighting

To set the contrast of the LCD and to switch the background lighting on and off, please proceed as follows:

- Select the SETUP option (see Figure 4 in the start mask. The Setup mask appears.
- Select the FRONTPANEL. The following mask appears:

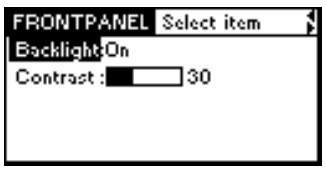

Figure 15: *The FRONTPANEL mask*

- Set the desired values for contrast and lighting with the ▶, ▲ and the ▼ keys.
- To save press ▶.
- To quit press ◀.

3.4. Enter Identification Number

At the factory each MERK II is assigned a unique serial number. This identifies each MERK II during communication.

In addition the operator can give a Merk II an identification number consisting of numbers and letters (maximum 128 characters). This number can also be assigned identically several times where several MERK IIs are involved (e.g. company name etc.). This identification number is exchanged both ways during communication.

To enter the identification number, proceed as follows:

(a) On the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `IDENTIFICATION`. The following mask appears:

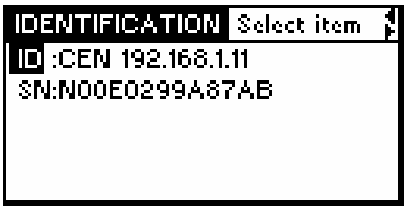

Figure 16: *The `IDENTIFICATION` mask*

- Enter the desired number with the ▶, ▲ and the ▼ keys and the number/letter keys.
- To close and save press ◀.

(b) Via the remote software:

- Select `STATUS CENTAURI IDENTIFICATION`;
- Enter the desired identification;
- Click on OK;

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4 Phonebook

You can enter the numbers of partners you often call in a phone book. These entries can be activated by simply pressing a key.

Every entry in a phone book is administered by name and contains the respective communication profile.

The entries appear sorted alphabetically by name.

They can be shifted up and down **on the LC display** with the ▲ and the ▼ keys. An entry is always shown inverted. This is selected as soon as you press the *) key. So that you don't have to endlessly scroll up and down in a long list, you can hop to the beginning of the entries by pressing a number or letter key direct with this symbol. Beyond this, you can skip to the top of the list by pressing "1", or to the bottom by pressing "9".

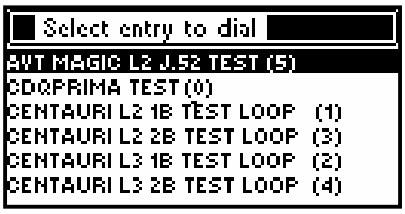
Select entry to dial
AVT MAGIC L2 J.52 TEST (5)
CDQPRIMA TEST (0)
CENTAURI L2 1B TEST LOOP (1)
CENTAURI L2 2B TEST LOOP (3)
CENTAURI L3 1B TEST LOOP (2)
CENTAURI L3 2B TEST LOOP (4)

Figure 17: *Subscriber list in the phone book; representation on the LC display*

In the windows of the remote control software **on the Windows PC** there are the usual scrolling bars for navigating. An entry is selected by mouse-click.

You can copy a MERK II's phone book on to a connected PC and save it there. On the other hand you can also transfer such a telephone file back onto a MERK II where you can use the entries. You therefore have the possibility of distributing one phone book on to as many MERK II as you want.

4.1. Saving Phonebook on a PC

- To save a MERK II's phone book on a PC, select `FILE SAVE PHONE BOOK` in the main window of the remote control software**.** A dialog window with the file list then opens.
- Enter the desired list and a file name on the PC.

  The file automatically includes the ending ".ctr".

- Click on "OK.

The phone book is then read out of the MERK II and saved in the given file. This is a pure ASCII file that can be edited with a simple text editor.

4.2. Transfer phone book to MERK II

- To transfer a phone book file from PC to MERK II, select `FILE LOAD CENTAURI FILE` in the main window of the remote control software**.** Then a dialog window opens with the file list.
- Select the desired hone book file and click on "OK".

The phone book file is then transferred to the MERK II. The phone book entries are then immediately available.

When the transfer is made, the existing phone book entries are written over in the MERK II.

4.3. Create Entry

To create a new phone book entry proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select NEW PHONEBOOK ENTRY and press the key. The following mask appears:

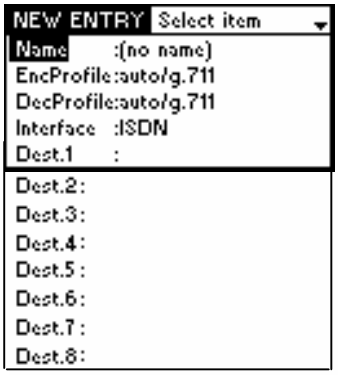

Figure 18: *The NEW ENTRY mask*

- Select one line after another using the , and keys and enter the desired data. Thereby please note:
  - NAME is the sorting and administration criterion
    The symbols are inserted at the position where the cursor is. Repeated pressing on one key brings the next symbol to the cursor position. When the desired symbol has been reached, wait a moment: the cursor jumps to the next position automatically after two seconds.
    If the entry is longer than the number of characters that fit in the input line, the line is shifted so that the cursor position can always be seen.
  - For ENCPROFILE and DECPROFILE you can enter a communication profile.
  - The transfer medium is entered with INTERFACE. This can be Loop, ISDN and NET.
  - DESTination determines the destination address and in the event of an ISDN connection the number of the ISDN connection. In the case of network connections this is where one enters an IP Address.
    In the case of multiple channel ISDN connections there are respectively more destination fields in which one must enter the numbers of the ISDN phones.
- End the entry process by pressing the key and confirm the query “Save new entry” with .

The entry has now been saved to the phone book.

If you started the entry procedure with the key, you assigned a number yourself right from the start which can be used as an abbreviated dialling number (see section "*abbreviated "). In all other cases, a consecutive number is assigned when the entry is saved.*

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(b) Via the remote control software:

- Click on the ”Phone book” button or press the ”P” key. The following dialog window opens:

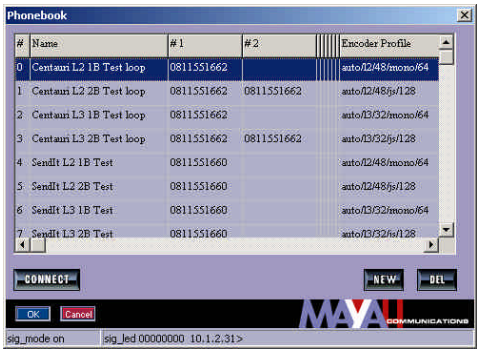
Phonebook
Name #1 #2 Encoder Profile
0 Centauri L2 1B Test loop 0811551662 auto/l2/48/mono/64
1 Centauri L2 2B Test loop 0811551662 0811551662 auto/l2/48/js/128
2 Centauri L3 1B Test loop 0811551662 auto/l3/32/mono/64
3 Centauri L3 2B Test loop 0811551662 0811551662 auto/l3/32/js/128
4 SendIt L2 1B Test 0811551660 auto/l2/48/mono/64
5 SendIt L2 2B Test 0811551660 auto/l2/48/js/128
6 SendIt L3 1B Test 0811551660 auto/l3/32/mono/64
7 SendIt L3 2B Test 0811551660 auto/l3/32/js/128
CONNECT
NEW
DEL
OK
Cancel
sig_mode on
sig_led 00000000 10,1,2,31>

Figure 19: *The PHONE BOOK dialog window*

- Click on “New” or press the “Insert” key on the keyboard. The following dialog window opens:

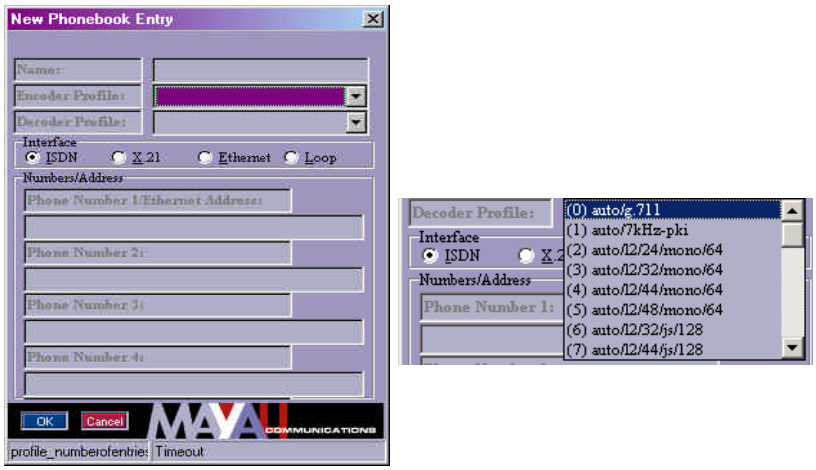

Figure 20: *The NEW PHONE BOOK ENTRY dialog window*

- Enter name, number of the ISDN line or network address and select a communication profile and the interface.
- To enter, click on “OK”.

This saves the entry in the phone book. A consecutive number is assigned automatically at this time, which can be used as an abbreviated dialling number (see section "abbreviated ").

4.4. Edit Entry

Existing phone book entries can be edited at any time.

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select EDIT PHONE BOOK and press . A list appears that contains all the entries in the phone book.
- Select the desired entry with the and keys and the press . The selected entry appears in the same style as for new entries (see Figure 18) and can now be edited.
- Change the data as desired;
- Save the changes by pressing the key and finish with .

(b) Via the remote control software:

- Click on the “Phone book” button or press the “P” key. The “Phone book” dialog window opens (see Figure 19).
- Select an entry with the scrolling bars or the cursor keys.
- Double-click on the entry to be edited or press the “E” key. The “Change Phonebook Entry” dialog window opens (corresponds to Figure 20).
- Edit the data as desired.
- To save, click on ”OK” or press the key on the keyboard.

The change in the phone book is now saved.

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4.5. Delete Entry

Existing phone book entries can be deleted at any time.

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `DELETE PHONE BOOK ENTRY` and press . A list appears with all the phone book entries.
- Select the entry to be deleted with the and keys;
- Press ; after a security request the entry will be deleted;

(b) Via the remote control software:

- Click on the “Phone book” button or press the “P” key. The “Phone book” dialog window opens (see Figure 19).
- Click on the entry to be deleted. This is marked with an inverse display.
- Click on ”DEL” to delete or press the ”Delete” key on the keyboard. The marked entry will be deleted from the screen display.
- Repeat both the above steps for each entry to be deleted.

  If you click on ”Cancel”, the deletion is not carried out and the entry appears / the entries appear again when the phone book is opened up again.

- To confirm the deletion and really execute it, click on ”OK”.

The entry / entries are now deleted from the phone book.

5 Configuration

5.1. Individual Parameters

If you use the built in phone book function for dialling a communication partner (selecting an already entered communication partner), you do not have to set individual parameters since each phone book entry already contains all the necessary data regarding the individual parameters.

If however you dial a communication partner without using the phone book function, i.e. ”direct by hand”, it might also be necessary to set individual connection parameters manually.

5.1.1. Set Encoder

You can set the encoder to 2 operational modes:

- Dependency: ”remote”; With this, the encoder is set according to the parameter that it receives from the distant decoder when the connection is made;

  For all Mayah products (CENTAURI, Merk II, SendIt) in “Automatic Mode” (Dependency: Remote, Format: Automatic) it is fundamentally valid that the calling device gives the settings for encoder and decoder.
  If a connection is made to a device from another manufacturer, the data flow coming from this device is used to determine with which setting this encoder works. This setting is then used for the decoder and also the MERK II’s encoder. This guarantees that a bi-directional audio connection also comes into being for these devices in most cases, without making additional settings.

- Dependency: ”local”; With this the encoder uses the locally set parameters in all cases, regardless of which device is on the other end of the transmission path or what the constitution of the received data flow is.

  This setting should only be chosen if the receiving device can also recognize the opposite end automatically, which is however incompatible with the MERK IIs.
  The “local” dependency setting for the decoder results in the fact that no adjustment is made to the incoming data flow. If the setting does not suit the data flow, either no, or faulty, audio is decoded.
  Via Format it is also possible to set “CDQ/H.221” (CCS), “MUSICTAXI”, “Micda” (if released), “Aptx” (if released) and “J.52” as well as “Automatic”.
  The setting “CDQ/H.221” switches the MERK II into a mode for transmitting MPEG Layer 2 data flows over more than two ISDN B channels to a CCS-CDQPrima.

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Special features for encoder / decoder settings with regard to dependency and format in combination with devices from other manufacturers

Encoder	Decoder	Remote Device	Description
Dependency = Remote Format = Auto	Dependency = Remote Format = Auto		MERK II default setting. The MERK II always performs in accordance with the remote device with this setting. There are a few exceptions to this rule which are explained below.
Dependency = Remote Format = CDQ/H.221 Bit rate = 384 kbit/s stereo 192 kbit/s mono	Dependency = Remote Format = CDQ/H.221 Bit rate = 384 kbit/s stereo 192 kbit/s mono	CDQPrima with proprietary H.221	When a CDQPrima calls a MERK II, automatic remote device recognition is functional (format = auto). If, on the other hand, a MERK II calls a CDQPrima, the channel connections are established too quickly. The “Format = CDQ/H.221” setting assures that channel connections are established one after the other.
Dependency = Local Format depends upon remote device	Dependency = Local Format depends upon remote device		Asymmetrical coding, encoder settings identical to remote device decoder settings, decoder settings identical to remote device encoder settings
Format = J.52	Dependency = Local Contains other desired parameters		J.52, but with fixed response values: J.52 normally negotiates the highest possible standard separately for each direction. For example, a device also accepts MPEG L3 at the receiver side (if technically feasible), even if it uses MPEG L2 at the transmitter side. However, if the settings “Format = J.52” and “Dependency = Local” have been selected, the MERK II alleges that it only understands the decoder settings.
Dependency = Local Format = J.52 Type = G.722			G.722 stat. framing: G.722 stat. framing cannot be recognized automatically, because no in-band signaling occurs. The MERK II normally uses the G.722 stat. framing timeout to this end (recommended: 25 sec.). A statistical audio signal must be present for signal recognition (not a sinusoidal tone!).
Dependency = Local Bit rate = path cycle rate			X.21/V.35

A detailed description of the J.52 format and automatic remote device recognition is available as a PDF file in the “Application Note (7)” from the download page at http://www.mayah.com.

To set the encoder, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `AUDIO ENCODER` and press ▶. The following mask appears:

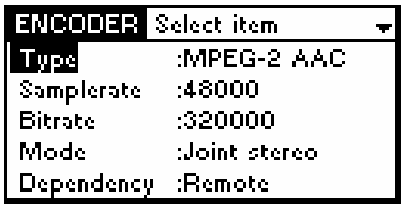

Figure 21: *The ENCODER mask*

- Select the parameter to be changed with the ▲ and ▼ keys and then press the ▶ key. A list of all possible values appears.
- Select the desired value with the ▲ and ▼ keys and then press the ▶ key.
- Repeat this procedure if required for additional parameters.
- End the setting by pressing the ◀ key.

(b) Via the remote control software:

- Select `SETTINGS CODEC`. The following dialog window opens:

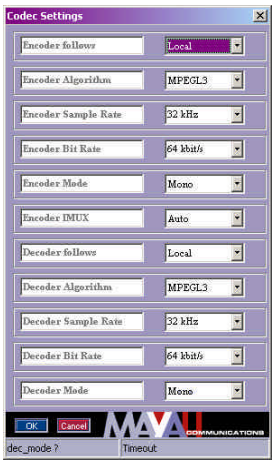

Figure 22: *The `CODEC SETTINGS` dialog window*

- Select the desired value the individual encoder lines.

  Note: The selection options for the decoder are explained in section "*Set Decoder*".

- To make the settings effective, click on "OK".

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5.1.2. Set Decoder

You can pre-set the decoder with 2 operational modes:

– Dependency: ”remote”; to this the decoder sets itself to the parameter that it receives from the distant encoder when the connection is made;
– Dependency: ”local”; with this the decoder uses the locally set parameters;

To set the decoder, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `AUDIO DECODER` and press ▶. The following mask appears:

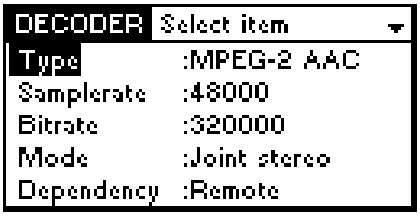

Figure 23: *The DECODER mask*

- Select the parameter to be changed with the ▲ and ▼ keys and then press the ▶ key. A list of all possible values appears.
- Select the desired value with the ▲ and ▼ keys and then press the ▶ key.
- Repeat this procedure if required for additional parameters.
- Exit the parameter setting function by pressing the ◀ key.

(b) Via the remote control software:

- Select `SETTINGS CODEC`. The following dialog window opens:

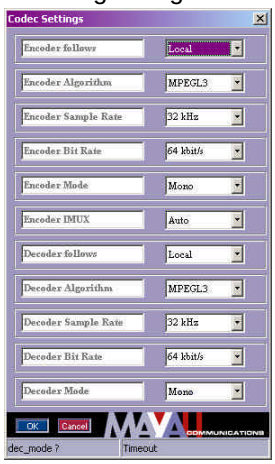

Figure 24: *The `CODEC SETTINGS` dialog window*

- Select the desired values under `DECODER .....`

It is only possible to set the decoder parameter if ”Dependency” is set to ”local”.

- To make the settings effective, click on ”OK”.

5.1.3. Set Inverse Multiplexer („Format“)

If a data stream is greater than the capacity of a transmission channel, it is then necessary to use two or even more ISDN B channels to ensure delay-free transmission. The transmitter must therefore split the data over the individual B channels and the receiver must put them back together again properly after the transmission. In the context of MPEG coded audio signals this procedure is often called inverse multiplexing (IMUX).

There are several different procedures for inverse multiplexing. The Merk II supports the international standard J.52 and the proprietary procedures of various manufacturers.

If you know exactly which device is on the receiving end, you can pre-set this device at the multiplexer. The Merk II ís however able to recognize the opposite station automatically and set itselve accordingly.

To set the multiplexer, proceed as follows:

(a) Via the **front panel**

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select AUDIO ENCODER or AUDIO DECODER and press ▶. The following mask appears:

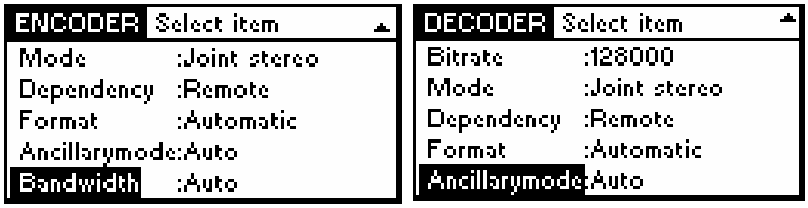

Figure 25: *The ENCODER or DECODER mask*

- Advance to the FORMAT line with the help of the ▲ and ▼ keys.
- Press the ▶ key. A list of possible selections appears.
- Select one of these options with the ▲ and ▼ keys and save the desired value by pressing the ▶ key.
- End the setting by pressing ◀.

(b) Via the remote control software:

- Select SETTINGS CODEC. The following dialog window opens:

Figure 26: *The CODEC SETTINGS dialog window*

- Select the desired option under ENCODER FORMAT.
- Click on ”OK” to save.

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5.1.4. Set Communication Interface

You can determine via which communication interface a connection is to be established. The following are available

- ISDN,
- Loop (for test purposes) and when the MERK II is correspondingly configured,
- NET

To set the communication interface, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select COMMUNICATION INTERFACE and press ▶. The following mask appears:

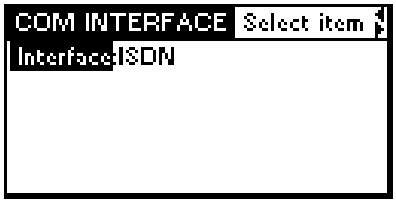

Figure 27: *The COMMUNICATION INTERFACE mask*

- Press ▶.
- Select the desired communication interface with the help of the ▲ and ▼ keys and press ▶
- End the setting by pressing ◀.

(b) Via the remote control software:

With the remote control software the communication interfaces and if necessary the network address are selected in the “Connect” dialog (see also section "Set up Connection").

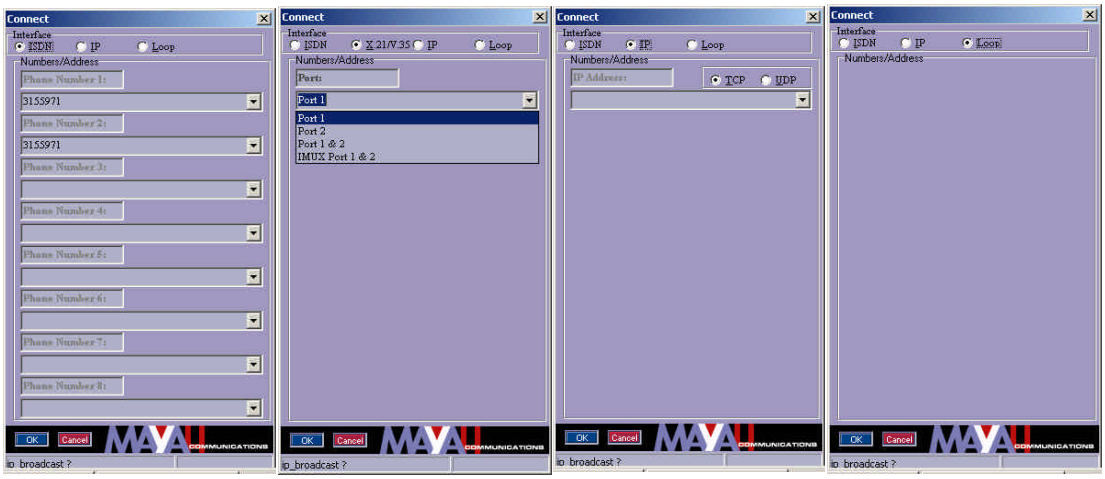

Figure 28: *The CONNECT dialog window with different selected interfaces*

5.1.5. Set Communication Basic Conditions

You can set the subordinate data transmission parameters (baud rate, handshake procedure, number of data bits, parity, stop bits) manually using the front panel of the MERK II.

- Select the option in the device Start mask (see Figure 4) die Option SETUP. The Setup mask appears.
- Select ANCILLARY and press . The following mask appears:

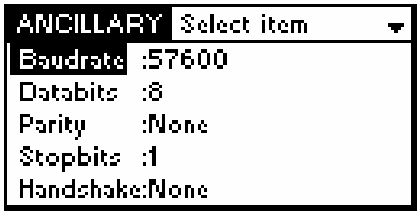

Figure 29: *The ANCILLARY mask*

- Select the desired parameter with the and keys and press .
- Select the desired value with the and keys and press .
- Repeat this for each parameter to be changed.
- Finish the setting by pressing .

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5.1.6. Set Device Address

You can assign the MERK II an address.

Attention!
For operational security reasons an IP address should only be entered manually in agreement with the network administrator. Setting the IP address yourself can lead to system disturbance.

To enter the address, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select NETWORK and press ▶. The following mask appears:

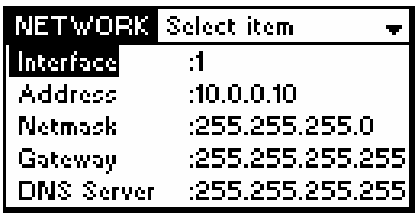

Figure 30: *The `COMMUNICATION INTERFACE` mask*

- Select the ADDRESS parameter with the ▲ and ▼ keys and press the ▶ key.
- Enter the desired address using the ▲ and ▼*) keys, as well as the numeric keys, and then press the ▶ key.
- Repeat this procedure for each address which needs to be changed.
- Exit the address setting function by pressing the ◀ key.

(b) Via the remote control software:

- Select `Settings Network`. The following dialog window opens

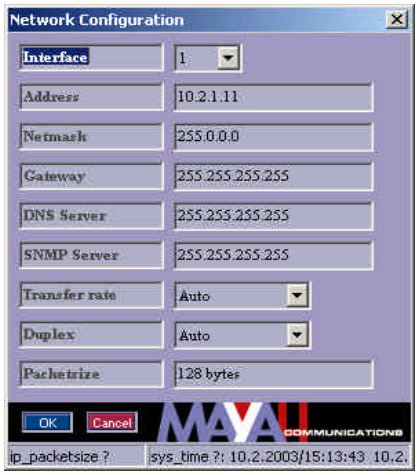

Figure 31: *The `Network Configuration` dialog window*

- Enter the address.
- Click on OK.

The entered IP address is now transmitted to the MERK II and entered there.

- For reasons of communication security you should now close the remote control software and restart.
- Switch off the appropriate MERK II and switch it back on after a few seconds.

5.1.7. Configure ISDN Adapter

If necessary you can set the ISDN adapter. This includes for example the dialling code if the device is used on an extension system.

To set the ISDN adapter, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `ISDN` and press ▶. The following mask appears:

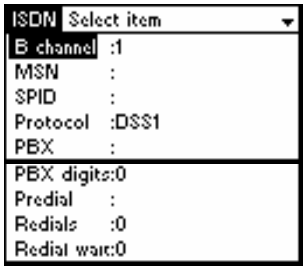

Figure 32: *The `ISDN` mask*

- Select the desired parameter with the ▲ and ▼ keys and press the ▶ key.
- Enter the desired value using the ▲ and ▼ keys, as well as the numeric keys if applicable, and then press the ▶ key.
- Repeat this procedure for each parameter which needs to be changed.
- Exit the configuration mode by pressing the ◀ key.

(b) Via the remote control software:

- Select `SETTINGS ISDN`. The following dialog window opens:

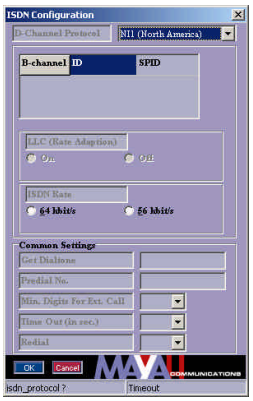

Figure 33: *The `ISDN CONFIGURATION` dialog window*

- Set the necessary values.
  Some entries are specific to the country in question and only appear on selecting the D channel protocol:
  B-Channel – To be able to set the MSN of a B channel, the corresponding B channel must first be selected.
  Get Dialtone – The purpose of this item is that a MERK II can be used just as well on a telephone system as on a multiple device line.
  Example: Get Dialtone set to 0 means that all numbers dialed will be preceded by a 0.

  Pre-dial No. – Serves to select the service provider. In Germany, Predial No 01033 means that Deutsche Telekom will always be used.
- To make the new parameter effective, click on “OK”.

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5.1.8. Setting Dial Protection and ISDN Service Protection

Undesired calls and network queries can be blocked from the MERK II if necessary. Two parameters are provided to this end:

– "Dial protection" and
– "ISDN service protection"

Dial protection allows you to determine whether or not the MERK II will accept all calls and network queries, or only calls and network queries from callers who have already been entered to the phone book.

ISDN service protection allows you to specify whether or not calls with certain ISDN service indentifications will be ignored by the MERK II. The following service identifications can be specified:

– no profile
– speech
– unrestricted dig. info
– restricted dig. info
– 3.1 kHz audio
– 7.0 kHz audio
– video
– packet mode
– 56 kB/s rate adapt.
– telephony
– facsimile 2/3
– facsimile 4/1
– teletex mixed mode
– teletex processable mode
– teletex basic mode
– videotext
– telex
– x.400
– x.200
– 7.0 kHz telephony
– video teleph. first
– video teleph. sec.

Each service identification can be individually enabled or disabled.

Attention!
Do not change dial protection or the service identification settings unless you know exactly what to change. Desired calls might otherwise be inadvertently blocked as well.

In order to set dial protection or select permissible service identifications at the housing front panel, proceed as follows:

(a) Via the front panel:

- Select the `SETUP` option in the start mask (see Figure 4). The setup mask appears.
- Select `SECURITY` and press the ▶ key. The following mask appears:

Figure 34: *The `SECURITY` Mask*

- Select "Dial Protection" or "ISDN Service Protection" with the ▲ and ▼ keys and then press the ▶ key.
- Select the desired parameter with the ▲ and ▼ keys and then press the ▶ key.

- Select “on” or “off” and then press the key;
- Repeat this procedure for each parameter which needs to be changed.
- End the setup procedure by pressing the key (twice if necessary).

(b) Via the remote control software:

1) Activating Dial protection

- Select `SETTINGS OTHERS`. The following dialog box appears:

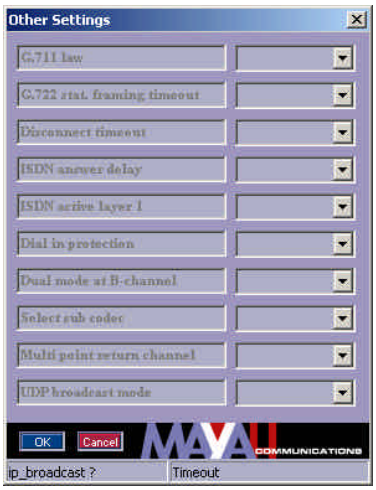

Figure 35: *The `OTHER SETTINGS` Dialog Box*

- Select the appropriate parameter setting under “Dial in protection” (“On” or “Off”).
- In order to activate the new setting, click the “OK” button.

2) Setting up ISDN service protection

- Select `EXPERT ISDN SERVICES`. The following dialog box appears:

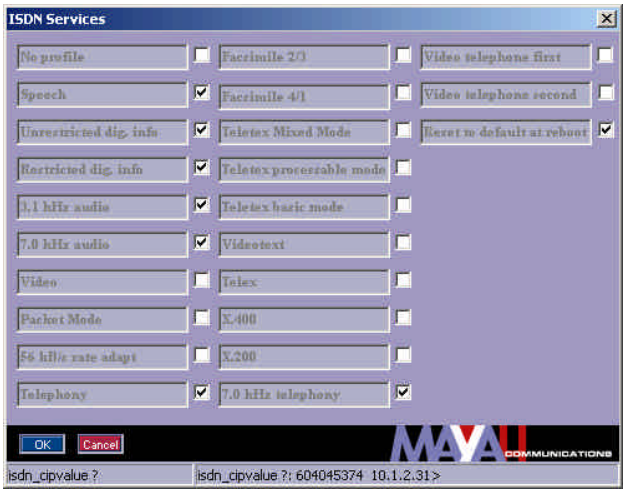

Figure 36: *The `ISDN SERVICES` Dialog Box*

- Click the check boxes which need to be changed.
  ☐ means “ISDN service identification disabled”.
  ☑ means “ISDN service identification enabled”.
- In order to activate your new settings, click the “OK” button.

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5.1.9. Set Quantization Procedure for G.711

Depending on the country, it can be necessary to set quantization procedure G.711 for ISDN telephony. This setting must be made when setting up operation and when the procedure used is changed (e.g. when the location of the device is changed).

To set the quantization procedure, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select MISCELLANEOUS and press ▶. The MISC mask appears.

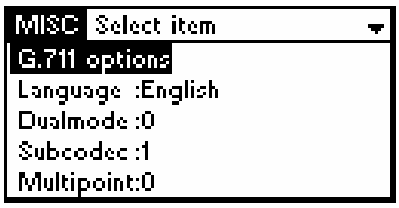

Figure 37: *The MISC mask*

- Press ▶ again.
- Select the respective parameter for “G711” (“A LAW” for Europe, “µ LAW” for USA) with the ▲ and ▼ keys and press the ▶ key.
- If necessary, set other parameters as desired in the same way (“G711 Level”, “Dualmode” and “Subcodec”).
- To end, press ◀.

(b) Via the remote control software:

- Select SETTINGS OTHERS. The following dialog window opens:

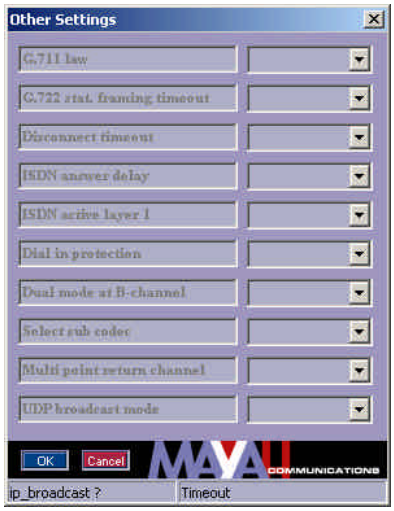

Figure 38: *The OTHER SETTINGS dialog window*

- Select the appropriate parameter (“A LAW” for Europe, “µ LAW” for USA) under “G.711 law”
- To make the new parameter effective, click on “OK”.

5.1.10. Set Time Limit (Timeout)

For particular transmission procedures (e.g. UDP) it is necessary to set a time limit.
To set the time limit, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select TIMEOUTS and press ▶. The TIMEOUTS mask appears.

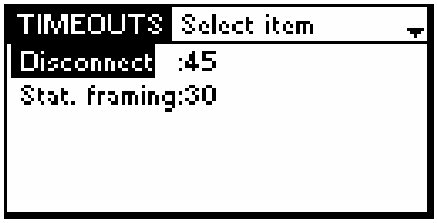

Figure 39: *The TIMEOUTS mask*

- Select the appropriate parameter ("Disconnect" or "Stat. framing") with the ▲ and ▼ keys and press the ▶ key.

The time after which the MERK II should break off the connection attempt when no synchronization (framing) is achieved is set with the "Disconnect" parameter. After this time has expired the ISDN channel(s) are automatically cut off.
The parameter "Stat. framing" gives the time interval after which the G.722 decoder should be started automatically in the case of a single channel ISDN connection if no other procedure is recognized.
Both parameters are given in seconds.

- Enter the desired values (seconds) with the number keys.
- To save press ▶ again.
- Press the ◀ key to end.

(b) Via the remote control software:

- Select SETTINGS OTHERS. The following dialog window opens:

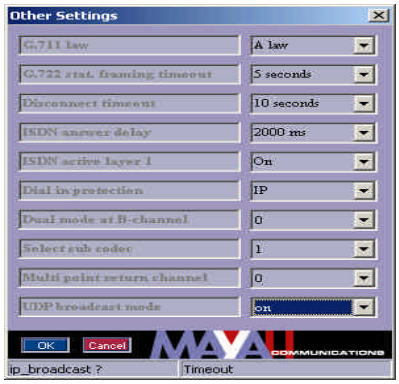

Figure 40: *Additional settings*

- Enter the desired time limit under "G.722 stat. framing timeout" or "Disconnect timeout".

G.722 stat. timeout shows how many seconds after the establishment of the connection the MERK II switches to G.722 stat. framing if there is no synchronization. This value should only be less than 15 seconds when the opposite end is definitely a device with G.722 stat. framing.

- To make the new values effective, click on "OK".

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5.1.11. Switch Dual Mode On/Off

Dual Mode must be switched on if bilingual sound is to be transmitted or if a completely separate transmission is to be made to different destinations over two channels. To switch Dual Mode on or off, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select MISCELLANEOUS and press ▶ The MISC mask appears.

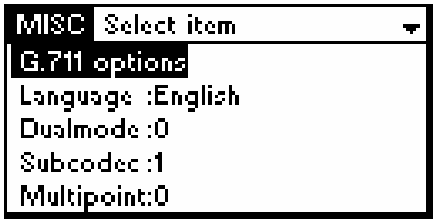


Figure 41: *The MISC mask*

- Select DUALMODE with the ▲ and ▼ keys and press ▶.
- Enter the desired value with the ▲ and ▼ keys and press ▶.
- To end press the ◀ key.

(b) Via the remote control software:

- To switch the Dual Mode on or off, select SETTINGS OTHERS in the remote control software. The following dialog window opens:

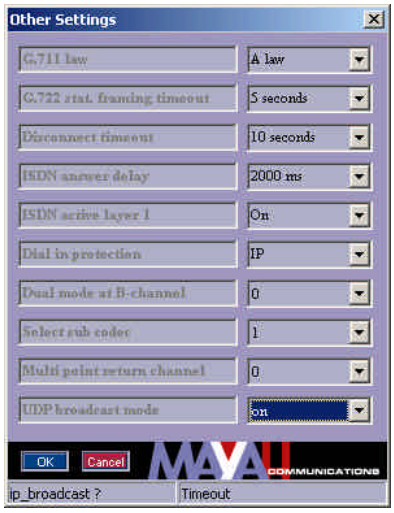


Figure 42: *Additional settings*

- Select the desired value under “Dual Mode at B-channel”.
- To make the new value effective, click on “OK”.

For Dual Mode only mono and sample rates <= 32 kHz can be used.

(a) Via the remote control software:

- Select `SETTINGS AUDIO` in the remote control software**.** The following dialog window opens:

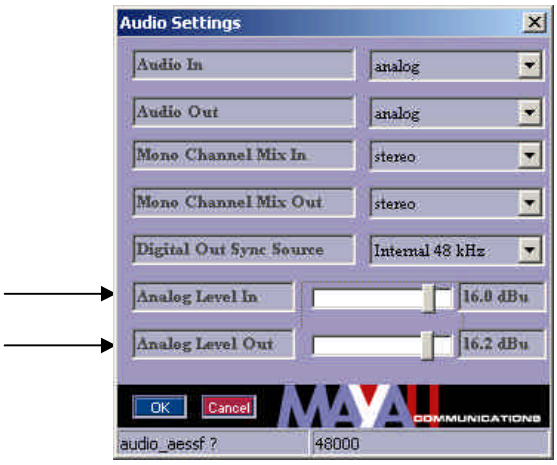


Figure 43: *The `AUDIO SETTINGS` dialog window*

- Set the desired level with the mouse under “Input Clipping” or “Output Clipping”.
- To make the new level effective, click on “OK”.

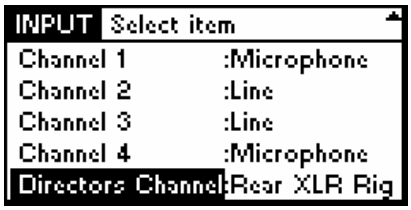
5.1.12. Set sources for the input channels

Here you can choose the input source for the 4 channels. Also the Directors Channel can be set to appropireate input.

This setting is only possible via the front panel, and not via the remote software:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.



- Select `Input` and press . The `Input`mask appears.

Figure 44: *The `Input` mask*

- Select the appropriate item with the and keys and press .
- Select the desired parameter with the and keys and press .
- Choose at “Director Channel” the source, which input audio should be heard, but not broadcasted.
- To end press the key.

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5.1.13. Set Microphone Settings

Here you can adjust different settings for the microphone channels on the front side.

This setting is only possible via the front panel, and not via the remote software:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `Microphone Settings` and press ▶. The `Microphone Settings` mask appears.

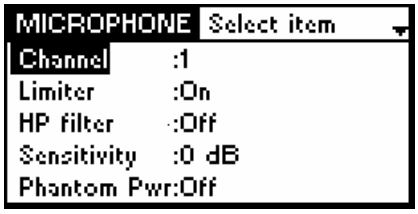

Figure 45: *The `Microphone Settings` mask*

- Select the appropriate item with the ▲ and ▼ keys and press ▶.
- Select the desired parameters with the ▲ and ▼ keys and press ▶.
- To end press the ◀ key.

5.1.14. Line In Settings

Here you can adjust different settings for the line in channels on the front side.

This setting is only possible via the front panel, and not via the remote software:

(b) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `Line IN` and press ▶. The `Line In` mask appears.

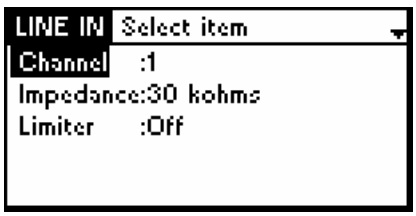

Figure 46: *The `Line In` mask*

- Select the appropriate item with the ▲ and ▼ keys and press ▶.
- Select the desired parameters with the ▲ and ▼ keys and press ▶.
- To end press the ◀ key.

5.1.15. Headphone Settings

Here you can adjust different settings for the headphone channels on the front side.

This setting is only possible via the front panel, and not via the remote software:

(c) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
  - Select `Line IN` and press . The `Line In` mask appears.

Figure 47: *Headphone Select Item*

- Select the appropriate item with the and keys and press .
- Select the desired parameters with the and keys and press .
- To end press the key.

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5.1.16. Line Out Settings

Here you can adjust different settings for the line out channels on the rear side.

This setting is only possible via the front panel, and not via the remote software:

(d) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `Line Out` and press ▶. The `Line Out` mask appears.

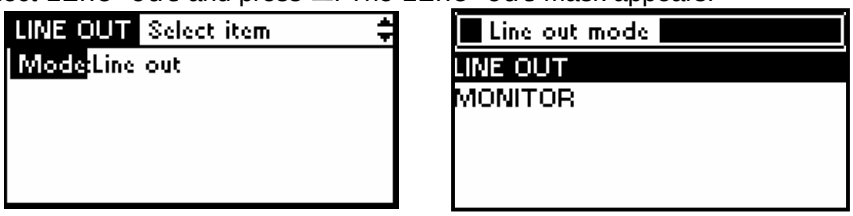

Figure 48: *The `Line Out` mask, the Line Out Mode mask*

- Select the appropriate item with the ▲ and ▼ keys and press ▶.
- Select the desired parameters with the ▲ and ▼ keys and press ▶.
- To end press the ◀ key.

5.1.17. Set Mute

Here you can adjust wether the different channels should react on mute or not and which function the mute-buttom should have.

This setting is only possible via the front panel, and not via the remote software:

(e) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `Mute` and press ▶. The `Mute` mask appears.

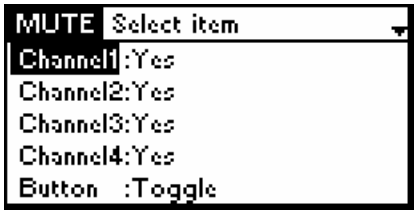

Figure 49: *The `Mute mask`*

- Select the appropriate channel with the ▲ and ▼ keys and press ▶.
- Select the desired parameters with the ▲ and ▼ keys and press ▶.
- To end press the ◀ key.

5.1.18. Mixer Profiles

Here you can handle the profiles for the mixer settings. Mayah preset profiles can not be changed or deleted.

This setting is only possible via the front panel, and not via the remote software:

(f) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select `Mixer Profiles` and press ▶. The `Mixer Profiles` mask appears.

Figure 50: *The `Mixer Profiles` mask*

- Select the appropriate channel with the ▲ and ▼ keys and press ▶.
- Select the desired parameters with the ▲ and ▼ keys and press ▶.
- To end press the ◀ key.

5.1.19. Set Number Of COM Ports To Be Checked

After the program is started the remote control software automatically requests the set number of MERK IIs connected to serial COM ports. In delivery condition only COM ports 1 and 2 are requested. The number of COM ports to be requested can however be increased to up to 8. To change the number of COM ports to be requested, proceed as follows:

- Select `EXPERT OPTIONS` in the remote control software**.** The following dialog window opens:

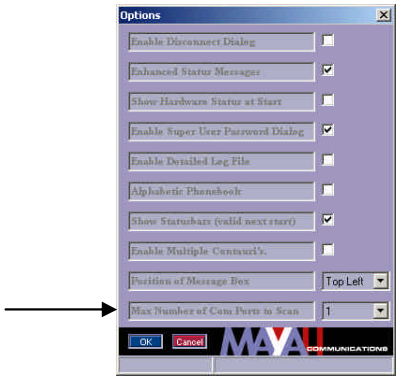

Figure 51: *The `OPTIONS` dialog window*

- Click on the drop-down list next to “Max. Number Com Ports to Scan”, and select the desired number.
- To make the setting effective, click on “OK”.

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5.1.20. Display Hardware Equipment at Program Start

After the program starts, the remote control software automatically displays the hardware equipment available in the MERK II if the corresponding option has been set. To switch the display option on and off, proceed as follows:

- Select EXPERT OPTIONS in the remote control software**.** The following dialog window opens:

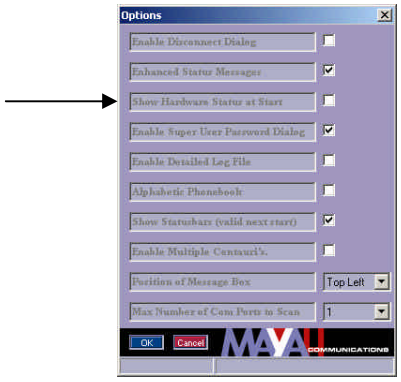

Figure 52: *The OPTIONS dialog window*

- Click the control box next to “Show Hardware Status at Start”, a tick in the control box means “display on”, no tick means “display off”.
- To make the setting effective, click on “OK”.

5.1.21. Switch Progress Display On/Off

If the main window of the remote control software contains the input focus, the encoder and the decoder are usually requested. The progress of this check is displayed in a dialog window. This progress display can be switched off.

To switch this display option on or off, proceed as follows:

- Select EXPERT OPTIONS in the remote control software**.** The following dialog window opens:

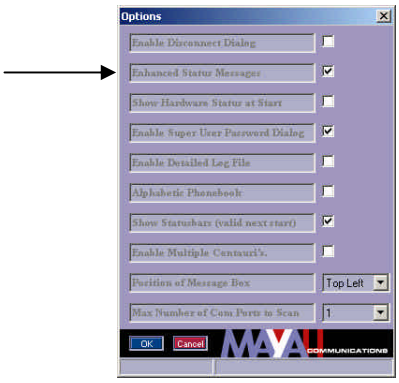

Figure 53: *The OPTIONS dialog window*

- Click the control box next to “Enhanced Status Messages”, a tick in the control box means “display on”, no tick means “display off”.
- To make the setting effective, click on “OK”. Switch Disconnect Dialog On/Off

The remote control software gives you the option of ending **all** existing connections or also **just individual** connections with a “Disconnect”. The “Disconnect” always ends all existing connections. To switch the selection on or off, proceed as follows:

- Select EXPERT OPTIONS in the remote control software**.** The following dialog window opens:

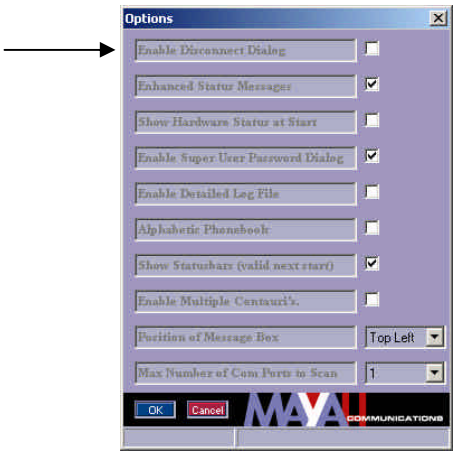

Figure 54: *The OPTIONS dialog window*

- Click the control box next to “Enable Disconnect Dialog”, A tick in the control box means “display on”, no tick means “display off”.
- To make the setting effective, click on “OK”.

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5.1.22. Release Software Module

The following software modules can be released:

- SNMP: Order Number CSW01
- Linear Audio via IP (CSW02)
- MPEG 4 AAC Low Delay
- ADPCM 4SB (Micda)

You can obtain the respective release codes on order from Mayah Communications after stating your MERK II serial number.

When you have received the release key code for the desired software module, enter it as follows:

- Select EXPERT SET KEY CODE in the remote control software**.** A dialog window opens in which you must enter the release key code.

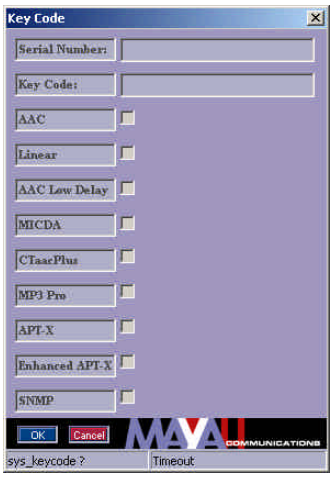

Figure 55: *The KEYCODE dialog window*

- After making the entry, click on “OK”.

This completes the release process.

5.2. Communication Profiles

A communication profile contains several settings for the encoder/decoder, like sample rate, bit rate etc., that are, besides the destination address, necessary for establishing a connection. These settings are described in more detail in section "Individual Parameters". The complete encoder/decoder settings can be stored in the profile list under any name you wish.

Communication profiles are of importance in establishing a connection to a communication partner. This is why every entry in the phone book is linked with a communication profile. Several phone book entries can be linked with the same communication profile. No phone book entry can be created without stating the communication profile.

When creating phone book entries, communication profiles are selected and used via a corresponding drop-down list (see section "Create Entry"

'The communication profiles are stored along with the phone book entries (see section "Saving Phonebook on a PC “). You can also transfer the communication profiles back to a MERK II and use the entries there (see section "Transfer phone book to MERK II "). Once you have created a communication profile file you can distribute the same communication profile file to as many MERK IIs as you wish.

5.2.1. Compile and Save Communication Profiles

To compile and save a communication profile, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select NEW PROFILE ENTRY and press ▶. The following mask appears:

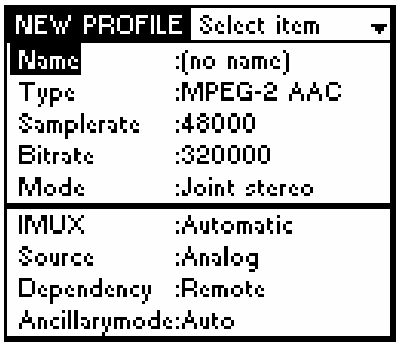

Figure 56: *The NEW PROFILE mask*

- If you want to save the current setting of the device, you just need to enter a name for the profile. All the current device settings are automatically entered when the mask is opened.
- If you want to save a setting that is different from the current setting, set the necessary values using the arrow keys. Then assign the profile a name.
- Save the communications profile by pressing the ◀ key and acknowledge the query message with OK by pressing the ▶ key.

(b) Via the remote control software:

- Select EXPERT PROFILES and enter the Super-User password. A dialog window opens with the already existing profiles.
- Click on NEW or press the “insert” key. A further dialog window will then open. In the simplest case you only need to assign a name.
- To save click on OK. The profile is then saved.

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5.2.2. Edit communication profiles

To edit a communication profile, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select EDIT PROFILE and press . A list appears that contains all the profiles from which the profile to be edited can be found.
- Select the communication profile to be edited and press . Then the same mask appears as in Figure 53.
- Alter the desired setting values using the arrow keys.
- Save the communications profile by pressing the key and acknowledge the device query message with OK by pressing the key.

(b) Via the remote control software:

- Select EXPERT PROFILES.
- Enter the Super User password (see also section "Remote Control Software Superuser Password "). A dialog window appears with the existing communication profiles.
- Select the profile to be edited and double-click on the corresponding line or press on the “E” key. This leads to another dialog window opening.
- Alter the desired parameters in this window.
- To save, click OK in both of the windows.

5.2.3. Delete communication profile

Communication profiles can only be deleted when they are not used in any of the phone book entries.

To delete a communication profile, proceed as follows:

(a) Via the front panel:

- Select the SETUP option in the Start mask (see Figure 4). The Setup mask appears.
- Select DELETE PROFILE ENTRY and press . A list of all profiles appears.
- Select the communication profile to be deleted and press .
- Respond to the security query with OK by pressing the key.

(b) Via the remote control software:

- Select EXPERT PROFILES. Enter the Super User password. A dialog window with the existing profiles and their parameters opens.
- Select the profile to be deleted.
- Click on DEL or press the “delete” key.
- To delete, click OK.

5.2.4. Save communication profile on the PC

The communication profiles are saved along with the phone book entries (see section "Saving Phonebook on a PC ").

5.2.5. Transfer communication profile file to the CENTAURI

You can also transfer the communication profiles along with the phone book entries from the PC to a MERK II again and use the entries there (see section "Transfer phone book to MERK II ").

When the transfer is made, the existing communication profiles are overwritten in the MERK II

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6 Connections/Transmissions

Merk II can set up connections to other communication partners on their own. They can also accept incoming calls automatically.

6.1. Automatic Acceptance of Calls

Merk II accepts incoming calls automatically and synchronize themselves with the station calling corresponding to the configuration.

When a call comes in, the “Connection Setup” mask appears in the display for a short time. When the connection is made the connection data with respect to the opposite end is displayed in this mask as a protocol.

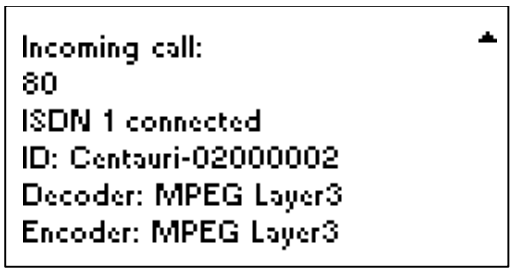

Figure 57: *The `CONNECTION STATUS` mask*

If you are just making settings or entries, you can end the display of this mask with . The mask will however disappear again on its own after a few seconds. Exactly the same display condition is then regenerated as it was prior to the Connect Report. An editing procedure in progress will not be discontinued if a connection is set up from outside.

6.2. Prepare Connection/Transfer

6.2.1. Mix Input Signals and Adjust Level

Before you set up the connection to your communication partner, we recommend that you set the signals to be transmitted suitably.

6.2.2. Select the correct bit rate

Merk II supports the procedures G.711, G.722, Layer 2, Layer 3, AAC, MPEG 4 AAC Low Delay and ADPCM 4SB (see table below), which behave very differently as far as quality and the required bit rate is concerned. Particularly in the case of coding standards based on a psycho-acoustic procedure such as L2, L3 and AAC, there is no longer the direct relationship between audio bandwidth = sampling rate / 2. Rather more, when using MPEG standards it is necessary to find the best compromise for the audio bandwidth for each combination of a bit rate with an sampling rate and a mode. This particular applies with respect to the very low data rates, since the maximum bandwidth can always be used for high data rates.

Furthermore, the sampling rate with which the encoder algorithm works does not automatically correspond to the sampling rate with which the digital AES/EBU input has to work. In order to adapt the MERK II to e.g. a 96 kHz studio environment in this case, the devices have sampling rate converters. It is thus possible to set the sampling rate of the encoder to the optimum value for the transmission procedure and bit rate independent of the environment.

How the sampling rate and the bandwidth of a monophonic signal at a bit rate of 64 kBit/s relate to each other, for example in the case of Layer 2, is shown in the following table:

Sampling rate (kHz)	16	24	32	48
Bandwidth (kHz) with Layer 2	7.5	10.25	9.0	8.25

You can see that the best sound quality with Layer 2 is achieved with a sampling rate of 24 kHz. At a higher sampling rate, the available bandwidth is reduced even more. If a specification states a bandwidth of 20 kHz at a data rate of 64 kBit/ s and a sampling rate of 48 kHz, the best possible sound quality is not to be expected.

If you want to find out more about these relationships, we recommend you study the appropriate literature on the subject.

The following sampling rates are recommended as a matter of principle:

	Mono		**Stereo**			
	64 kBit/s	**128 kBit/s**	**64 kBit/s**	**128 kBit/s**	**192 kBit/s**	**256 kBit/s**
G.711	8 kHz	-	-	-	-	-
G.722	16 kHz	-	-	-	-	-
Layer 2	24 kHz	32 kHz	16 kHz	32 kHz	48 kHz	48 kHz
Layer 3	32 kHz	32 kHz	24 kHz	32 kHz	48 kHz	48 kHz
AAC	48 kHz	48 kHz	48 kHz	48 kHz	48 kHz	48 kHz
MPEG 4 AAC Low Delay[*)]	48 kHz	48 kHz	48 kHz	48 kHz	48 kHz	48 kHz
ADPCM 4SB[*)]	-	32 kHz	-	-	-	32 kHz
Stand. APT-X	16 kHz	32 kHz	8 kHz	16 kHz	24 kHz	32 kHz
Enh. APT-X 16	16 kHz	32 kHz	8 kHz	16 kHz	24 kHz	32 kHz
Enh. APT-X 20	12,8 kHz	25,6 kHz		12,8 kHz	19,2 kHz	25,6 kHz
Enh. APT-X 24	10,67 kHz	21,3 kHz		10,67 kHz	16 kHz	21,3 kHz

[*)] if released

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6.3. Set up Connection

(a) Via the front panel:

Connections can be established with communications partners in two different ways: either via the start mask and the connect function, or by means of abbreviated dialling.

1) Establishing a connection via the start mask

In order to set up a connection to a communications partner via the start mask, proceed as follows:

- Select the CONNECT option in the Start mask with the arrow key and press . The following mask now appears on the display:

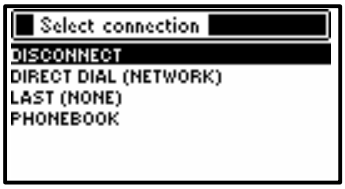

Figure 58: *The CONNECT-DIALOG mask*

- Select either DIRECT DIAL (enter telephone number directly), LAST (set up the previous connection again) or PHONE BOOK (select subscriber from the phone book).
  If you have selected LAST, the device immediately starts establishing the connection.
- Otherwise you should enter the desired phone number (DIRECT DIAL) or select a subscriber from the phone book.

In the phone book you enter a letter with the letter keys and the list then skips to the first entry starting with the letter entered.

The device then begins to establish a connection to the desired communications partner.

2) Establishing a connection by means of abbreviated dialling

In order to establish a connection by means of abbreviated dialling, proceed as follows:

- Press the key. The SPEED DIAL mask appears.

Figure 59: *The SPEED DIAL mask*

This function is not available if configuration functions are currently being used at the Merk II (e.g. parameter settings for the audio encoder, scrolling through journal entries etc.).

- Press the key.
- Enter a number at the keypad with a maximum of two digits which has been assigned to phone book entry and press the key.
- Select CONNECT and press the key.

  The device now establishes a connection to the corresponding communications partner.

(b) Via the remote control software:

- Click on CONNECT or press the “C” key (enter phone number direct) or click on PHONE BOOK or press the “P” key (select subscriber from the phone book). One of the following dialog windows opens, depending on the selected data interface:

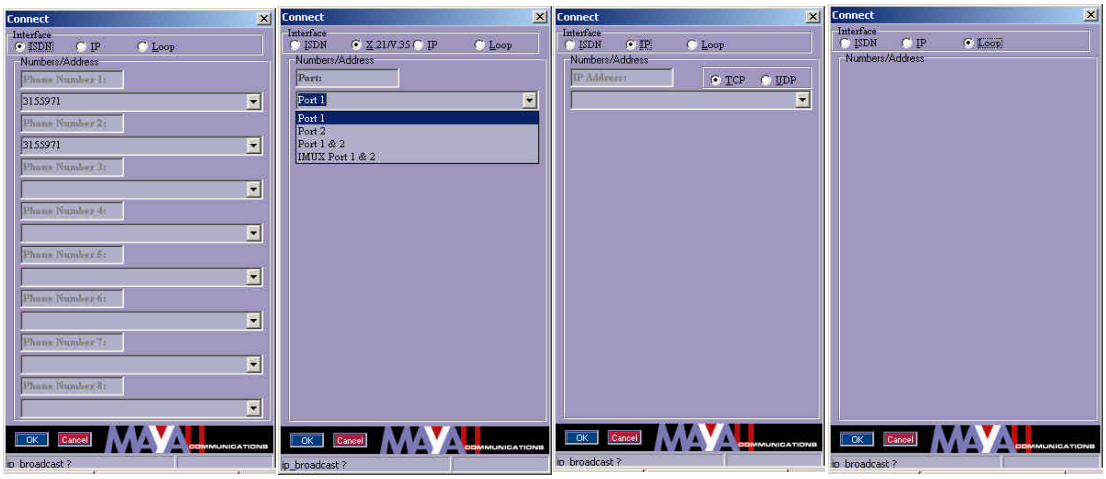

Figure 60: *The CONNECT DIALOG window with various selected interfaces*

- Select the desired parameter in the dialog window.
- Click on OK.

The device then starts to set up the connection to the desired communication partner.

You can follow this process on the MERK II’s display in the CONNECTION SETUP or in the window of the remote control software:

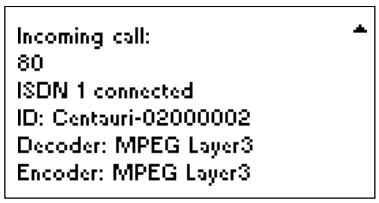

Figure 61: *The CONNECTION STATUS mask*

After the connection has been set up successfully, the device switches to the mask that was displayed beforehand. If you want to monitor the existing connection, select STATUS (see the following section “Execute and Monitor Transmission”).

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6.4. Execute and Monitor Transmission

During the transmission you can check and monitor the status of the connection at any time.

(a) On the LC Display on the front panel

- To check and monitor the status of a connection, select STATUS in the Start mask (see Figure 4) and press ▶. The modulation display then appears:

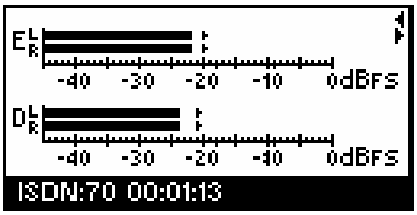

Figure 62: *Modulation display: The right-hand edges of the bars indicate the current value.*

Specific values: Depite of the normal scala which accent the DB-values in steps of five, there are two particular values diplayed: *-9 dB* : normally used headroom
-18 dB : with 18 dBu fullscale (default Merk II setting), –18 dBf is equal to 0 dBu

Since not all the information relating to a connection can be displayed on the LC display at the same time, the various pieces of status information are spread across several masks. You can cause these masks to be displayed one after another using the left or right arrow keys. The name of the connection is always displayed in the footnote (phone book entry, number of the ISDN line or network name):

Figure 63: *Encoder status*

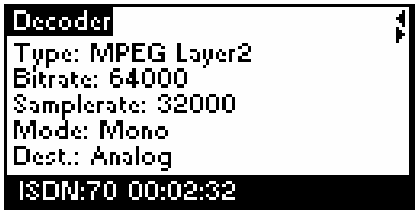

Figure 64: *Decoder status*

Figure 65: *Communication channels configured for the connection*

Note: The values of the encoder/decoder currently in operation are normally shown in the status display on the front panel. If there is no framing, the values configured in the setup are displayed.

(b) In the remote control software window

The status of the current existing connection is always displayed in the window of the remote control software:

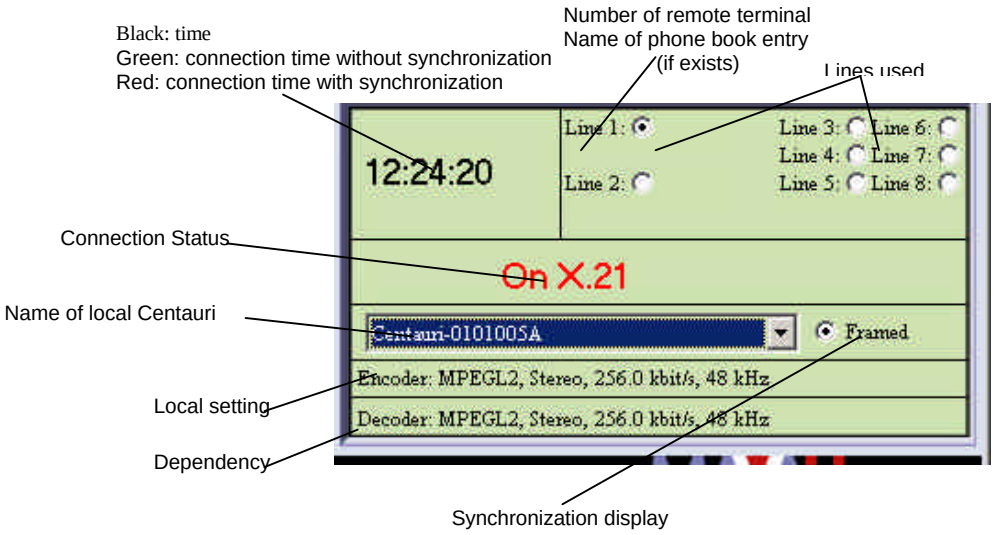

Figure 66: *Remote control software status display*

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6.5. Indications

The Merk II is able to react to internal and external events.

There is more about this topic on page 9.

6.6. Cut Connection

You can cut an existing connection at any time.

(a) Via the front panel:

In order to break off an existing connection, proceed as follows:

1) Via the start mask

- Select CONNECT in the start mask (see Figure 4) and press the key.
- Now select DISCONNECT and press the key once again.

2) Via the speed dial key

- Press the *) key. The SPEED DIAL mask appears.

Figure 67: *The SPEED DIAL mask*

- Select DISCONNECT and press the key once again.

  The connection is broken off immediately. All of the channels utilized by the connection are closed, i.e. both B channels of a two-channel ISDN connection.

(b) Via the remote control software:

- To cut an existing connection, click DISCONNECT in the program window. The connection is cut off immediately. All the channels belonging to a connection are closed, i.e. in the case of a two-channel ISDN connection, both B channels.

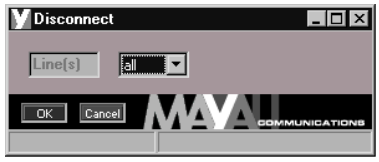

Figure 68: *Disconnect dialog mask, if several connections exist*

Note: One separate connection can be displayed up to a maximum of 49.7 days (this value depends on the type of cardinal variable in which it is stored, exactly 2^{32} – 1 ms).

6.7. Connection Protocol

You can cause the connection protocol (Journal) to be displayed on the display.

(a) On the LC display on the front panel

- Select MISC in the Start mask (see Figure 4) and press ▶.
- Select JOURNAL and press ▶.

  The journal now appears on the display:

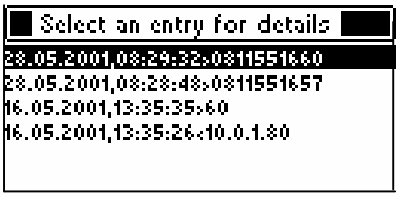

Figure 69: *Journal*

The connection direction is displayed well as date and time (for display format see section "Set Time, Date and Date Format "). The symbol '>' means outgoing call (MERK II has called), and the symbol '<' means incoming call (MERK II was called).

The address of the partner is displayed behind it. If the device has found the address in the phone book it displays the name of the entry or the address itself.

If you select a list entry with ▲ or ▼, and press ▶, more information about this connection will appear on the display. Where there is a greater amount of information you can page by pressing ▲ or ▼.

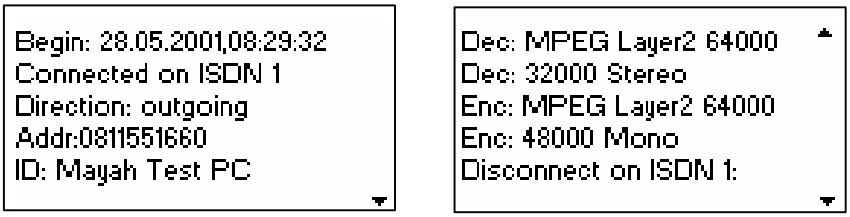

Figure 70: *Information about the selected connection (example)*

(b) In the remote control software window

Prerequisite: IP control

The log file can be called up with the menu item <File/Display Log File>. In the menu item <Expert/Options> it is also possible to set whether the log file is displayed

– simply (only connection set up and cut off) or
– in detail.

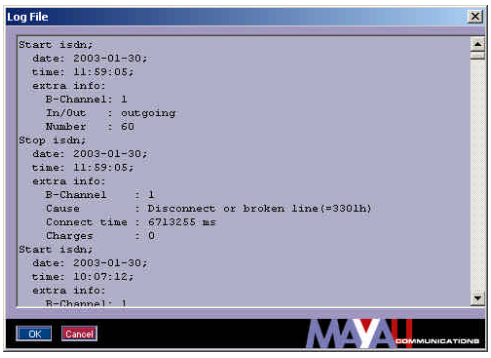

Figure 71: *The LOGFILE dialog window*

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7 Internet Protocol

So that this handbook is not more extensive than absolutely necessary, we assume basic knowledge about the Internet Protocol (IP). If you are not familiar with the topic "Internet Protocol", we recommend you refer to the appropriate literature on the subject.

Every Merk II has a network interface card with a 10Base-T/100Base- TX-RJ-45 connection. The connection configures itself to the existing network speed (10 or 100 MBit/sec).

The Merk II supports the Internet Protocol, either connection-orientated (TCP) or without connection (UDP) as a protocol on the network.

You can find more detailed descriptions of the various protocols in the "*Glossary*"*.*

All device types from the MERK II family can be remote controlled via the network interface.

The devices of the CENTAURI 3000 series also permit the transport of digital audio signals via the network interface.

Each Merk II can be connected to a normal local Ethernet via the network interface. Apart from the physical connection it is only necessary to enter the unique IP address.

7.1. Remote Control via IP

For management and control functions the Merk II provides two different protocols:

- In the simplest case a TCP/IP connection is set up with a PC on which the remote control software provided runs. The data exchange is achieved via a simple IP Port Protocol. This protocol can also be used for the development of more complex control systems.
- For the integration into network structures, Merk II can be connected by means of a management interface via the SNMP(v1) (Simple Network Management Protocol). For this the gateway acts as 'Agent', i.e. a manageable device in the network. Information about the current status of the device and the individual interfaces can be requested via SNMP. The gateway can also trigger a network report (Trap) when a particular, predefined event occurs that can be received and evaluated by the management system.

7.2. Digital Audio via IP

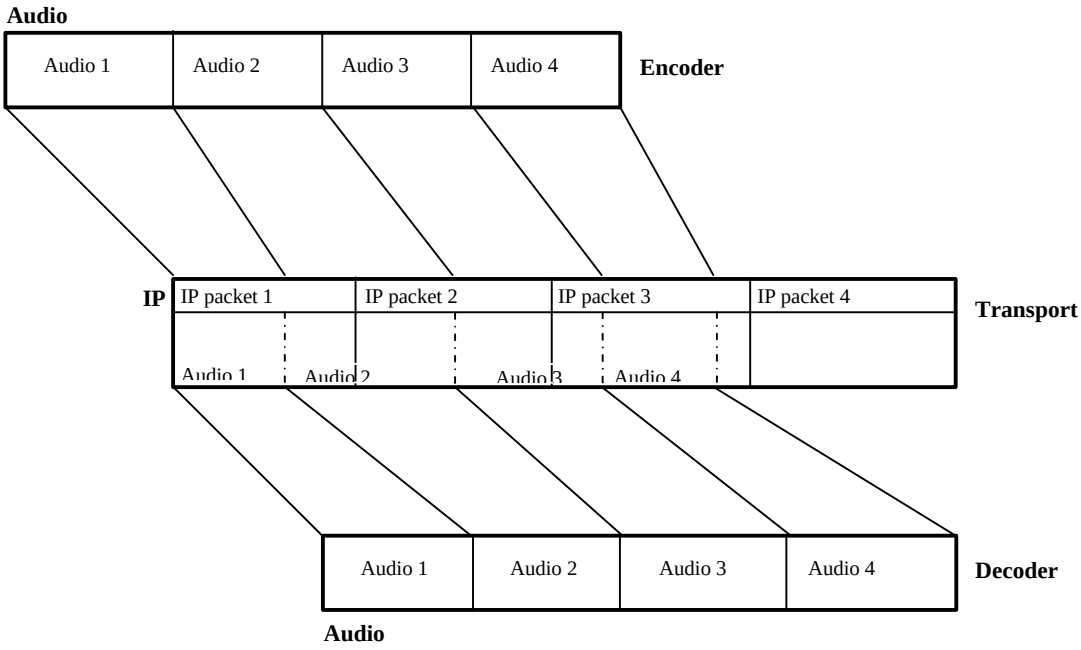
Besides the monitoring and management functions, the Merk II also provides the possibility of audio transport via IP.

This means, for example, that a signal lying at the audio input can be transmitted into the network using an TCP or UDP.

In the average case of audio data transport via IP, one IP-packet carries exactly one audio frame. Depending on frame length and packet size there is a specific overhead in each IP-packet. An exception can occur if the data transport isn't working correctly due to different possible reasons, e.g. network problems. In this situation, if the IP-packets are refused and have to be sent again, the audio frames are allocated to the IP packets in a different way.

7.2.1. One IP-packet carries more than one frame

This would be the normal way of audio transport in a situation described above. As you can see in the following figure, the first IP-packet carries not only the first audio frame but also parts of the second one. The second IP-packet carries the rest of Audio 2 and parts of Audio 3. IP-packet 3 carries the rest of Audio 3 and Audio 4 etc..



7.2.2. One frame is carried by more than one IP-packet

In specific situations, e.g. if the bit rate is high and the sample rate is low, the frame length can be larger than the packet size. In this case the first IP-packet would only carry parts of the first audio and IP-packet 2 the rest etc..

In both situations it is necessary to get access to the frame header to be able to read the information about frame length, bit rate, sample rate etc.. How to get this information is dealt with in the following chapter.

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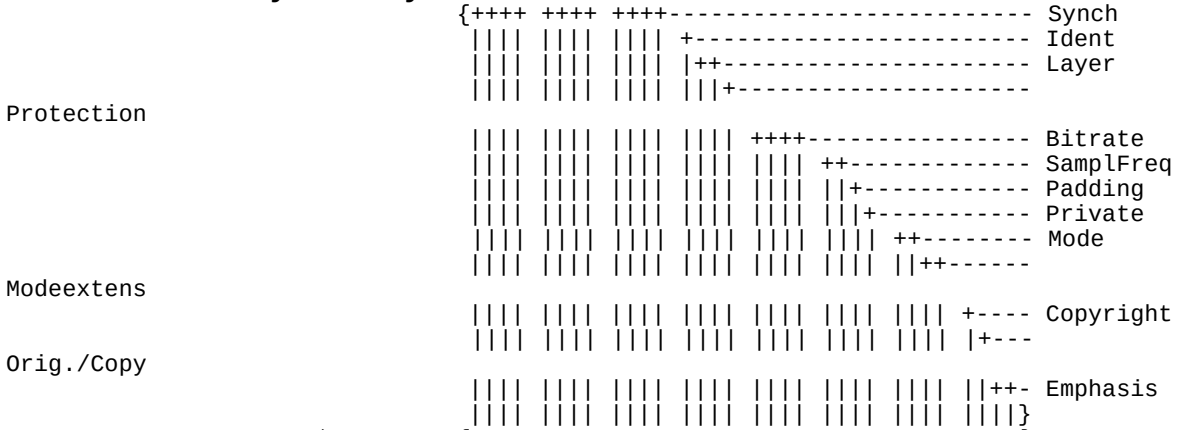
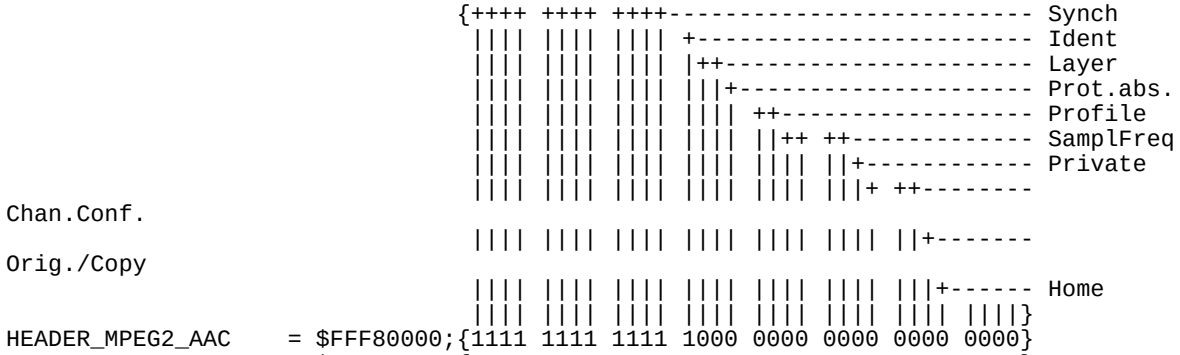
7.3. Header information

The structure of the headers for MPEG Layer2/3, AAC/CT-aacPlus and AAC Low Delay are described in the following chapters.

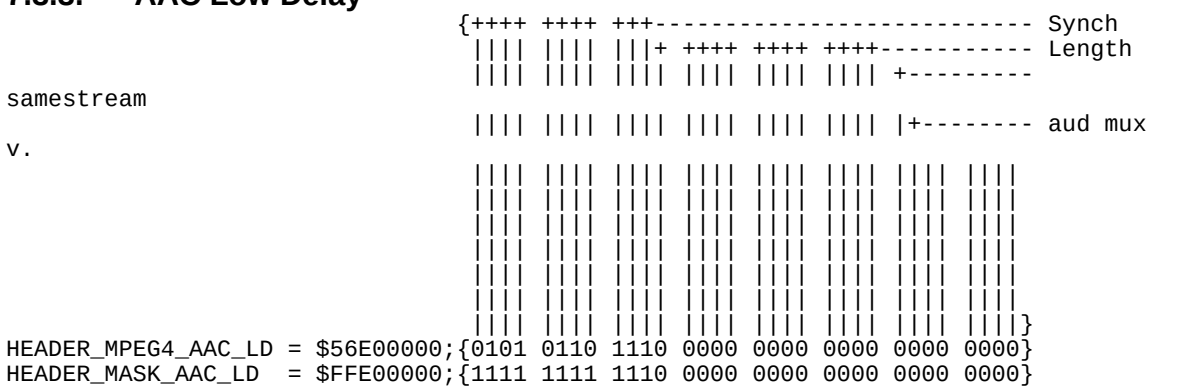
7.3.1. MPEG Layer 2 / Layer 3 frame header



7.3.2. AAC/CT-aacPlus-Header



7.3.3. AAC Low Delay



```
LENGTH_MASK_AAC_LD  = $001FFF00;{0000 0000 0001 1111 1111 1111 0000 0000}
```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7.4. HTTP streaming over IP

7.4.1. HTTP Streaming

In loop-mode operation the Merk II is able to generate one audio stream (encoder) which can be executed by HTML command files stored in the WWW directory of the Merk II. It can be activated from any web client or media player.

.

7.4.2. Structure of HTTP Command Files

The HTML command files have a strictly defined structure (see also sample files):

Syntax:

```
<!--#exec cgi="/streamfile.cgi <Param1> <Param2> <Param3>
<Param4> <Param5>"-->
```

Parameters:

```
Param1:  [SlotNr]
Param2:  [Algorithm]
Param3   [Samplerate]
Param4:  [Bitrate]
Param5:  [Mode]
```

- ***SlotNr*** defines the encoder slot that should run the requested algorithm. This value has to be 1 for Merk II, for there is just one slot available.
- ***Algorithm***, ***Samplerate***, ***Bitrate*** and ***Mode*** must be used as defined in the encoder section of the Centauri Gateway, Communication Reference Manual.

Streaming with different sample rates does not function correctly unless the rates are multiples of the running sample rates. Example: A mix of 32 and 48 kHz does not work. A mix of 8, 16, and 32 kHz or a mix of 8, 16 and 48 kHz works well.

Sample files:

Stream1.htm:

```
<!--#exec cgi="/streamfile.cgi 1 mpegl3 44100 48000 mono"--
>
```

Stream2.htm:

```
<!--#exec cgi="/streamfile.cgi 1 mp3pro 44100 48000 mono"--
>
```

7.4.3. Generating HTTP Command Files

A HTTP command file can be generated with any common text editor. It contains one line using the structure described above. Additional lines are not read. The file can be saved under any name with the .htm extension. After generating the command file, it has to be transferred by an FTP client program to the D:\www\ folder at the Merk II, where it is made available via the net.

7.4.4. Executing HTTP Command Files

The execution of the command file can be activated by any web client or media player which is part of the net. The following structure must be used:

```
http://[Merk II-address or name]/[command file-name. exten-
sion(irrelevant)]
```

Example:

```
http://10.0.0.255/stream.mp3
```

```
http:// Merk II Exa/stream.wav
```

http//Merk II-address or name/ activates a search in the www folder of the addressed Merk II. The name of the command file is only significant for searching. The extension only defines how the data should be interpreted. This option makes it possible to execute different formats from any web browser, which is important for HTML programming.

Example: An HTTP request to STREAM1.mp2, STREAM1.wav or STREAM1.mp3 from a web browser is executed by the web server by the STREAM1.htm HTTP command file.

All HTTP requests start an audio stream/encoder with the requested parameter, if no other audio stream/encoder is currently active. After the last HTTP request has been executed by the web client/player, the audio stream/encoder is stopped.

7.5. Establishing IP connections

7.5.1. Unicast RTP

Unicast RTP connections can be established by CENTAURI's of type 300x, 330x, 400x, MERKII and GANYMED's 1102 using system software version 2.0.0.132 (or later).

RTP (=Realtime Transport Protocol) protocol bases on UDP (= User Datagram Protocol). Therefore the RTP implementation of MERK II / CENTAURI II is an enhancement of the UDP implementation. In opposite to the pure UDP implementation RTP guarantees the right sequence of packets at the receiver side.

RTP supports the following features:
- payload-type identification
- sequence numbering
- time stamping
- source identification

· RTP is implemented according to rfc 3550 (www.ietf.org/rfc/rfc3550.txt).

If possible RTP is the recommended IP-transmission method between establishing sides (MERK II / CENTAURI II).

1. Unidirectional RTP connections

Unidirectional IP connections between two establishing sides (MERK II / CENTAURI II) can established by the following steps:

1.1 Codec Settings

Configure the codec settings via menu item Settings/Codec (valid for both establishing sides (MERK II / CENTAURI II)):

· Interface: IP

· Encoder dependeny: Remote

· Decoder dependency: Remote

The establishing establishing sides (MERK II / CENTAURI II) determines the algorithm, the sample rate, the bit rate and the mode of the transmission.

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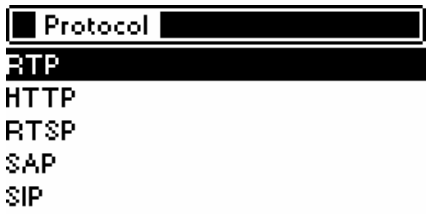
1.2 Establish Connection

Click the CONNECT button to open the Connect-dialog:

· Select interface to IP

· Select RTP



· Type in the IP-address of the other codec in the address field

· Click the OK-button to establish connection

2. Bidirectional RTP connections

There are two ways to establish a bidirectional RTP connection:

· Establish a unidirectional RTP connection on both sides (MERK II / CENTAURI II)

· Use a special codec configuration on the establishing sides (MERK II / CENTAURI II)

2.1 Special configuration on establishing MAYAH codec

Configure the codec settings via menu item Settings/Codec:

· Encoder dependency: remote

· Decoder dependency: local

2.2 Special configuration on non-establishing MAYAH codec

Configure the codec settings via menu item Settings/Codec:

· Encoder dependency: remote

· Decoder dependency: remote

Note:

At such bidirectional RTP connections different settings for sending and receiving can be used. The encoder settings determine which quality is sent whereas the decoder settings determine which quality is received.

Note 2:

In opposite to bidirectional UDP connections bidirectional RTP connections can be disconnected by one side (i.e. the establishing side) provided they were established by one side.

7.5.2. Multicast RTP

Multicast RTP connections can be established by CENTAURI's of type 300x, 330x, 400x, MERKII and GANYMED's 1102.

Multicast RTP connections can be established between:

· CENTAURI's, MERK's II and GANYMED's 1102:
MERK IIs can be used as Multicast Sender and Multicast Receiver.
For this the new RTP protocol implementation of MERK II is used.

· MERK II and other decoders (like Winamp 5.05): MERK II is used as Multicast Sender.

· MERK II and GANYMED 1002

1. Multicast RTP connection to other CENTAURI, MERK II and GANYMED 1102

New RTP protocol implementation is used.

1.1 Codec Settings of Multicast sender

Configure the codec settings via menu item Settings/Codec:

· Encoder dependency: Local

· Decoder dependency: Remote

The audio quality of the multicast stream is determined by the encoder settings of algorithm, sample rate, bit rate and mode of the Multicast sender.

1.2 Codec Settings of Multicast receiver

Configure the codec settings via menu item Settings/Codec:

· Encoder dependency: Remote

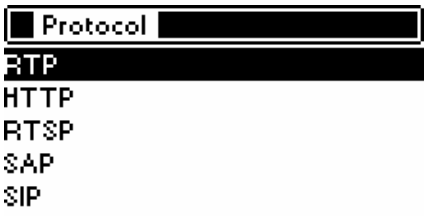
· Decoder dependency: Remote

1.3. Establish Connection (Multicast Sender and Receiver)

Click the CONNECT button to open the Connect-dialog:

· Select interface to IP

· Select RTP



· Type in the Multicast IP-address (e.g. 225.0.0.2)
Note:
A special port can be selected by the optional suffix ':<port number>'
(e.g. 225.0.0.2:5004)

· Click the OK-button to establish connection

2. Multicast RTP connection to other decoders

Old RTP protocol implementation is used provided system software <= 2.1.0.46.

2.1 Codec Settings of Multicast sender

Configure the codec settings via menu item Settings/Codec:

· Encoder dependency: Local

· Decoder dependency: Remote

The audio quality of the multicast stream is determined by the encoder settings of algorithm, sample rate, bit rate and mode of the Multicast sender.

2.2. Establish Connection (Multicast Sender)

Click the CONNECT button to open the Connect-dialog:

· Select interface to IP

· Select RTP

· Type in the Multicast IP-address preceded with a 'r'
Note:
Since system software version 2.1.0.47 no more 'r' is necessary
Note 2:
A special port can be selected by the optional suffix ':<port number>'
(e.g. r225.0.0.2:5004)

· Click the OK-button to establish connection

2.3 Establish Connection (other decoder)

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Please consult the manual of the refering decoder for this.
Here the steps for Winamp 5.05 (just works with MPEGL2 and MPEGL3)

· Ensure that the latest ‘in_rtp.dll’ Plugin is installed

· Step to menu item <File/Play URL..>

· Type in: rtp://<Multicast IP-address>:<port number>
Example:
rtp://225.0.0.2:5004

· Click the Open-button to establish connection

7.5.3. SAP Streaming

SAP streaming is more or less an enhancement of SDP streaming (see SDP streaming). SDP and SAP streaming are supported with system software version 2.1.0.50 (or later).

SAP stands for session announcement protocol. Same as SDP streaming (see SDP streaming) a SDP file is created but additionally the SDP information is send to the Multicast address 224.2.127.254. The SAP decoder retrieves the SDP information from this Multicast address (and not from the SDP Encoder). SAP announcements are sent on port 9875.

There are two advantages of SAP streaming compared to SDP streaming:

a) Since the SDP file must not be retrieved from the encoder device, unidirectional connections are sufficient (e.g. important for satellite transmissions).

b) At Multicast address 224.2.127.254 the SDP information of all SAP streaming encoders is available (and not just the SDP information of one device).

More info about SAP can be found in rfc 2974 (www.ietf.org/rfc/rfc2974.txt).

1. Configuration steps at MERK II encoder

1.1 Codec settings

Configure the codec settings via menu item Settings/Codec:

· Interface: IP/RTP

· Encoder dependency: Remote

· Encoder algorithm: Algorithm supported by the other side codec
Note:
With SAP streaming the MERK II supports the algorithms AAC (MPEG4) and AAC (HE)

· Decoder dependency: Remote

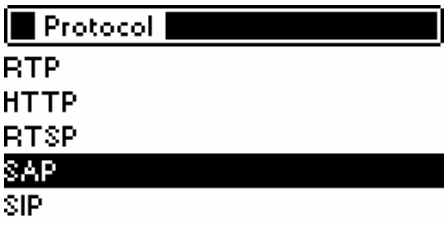
1.2. Establish Connection

Click the CONNECT button to open the Connect-dialog:

· Select interface to IP

· Select SDP/Encoder

· Check SAP



· Type in the IP-address

· Click the OK-button to establish connection

2. Configuration steps at MERK II decoder

2.1 Codec settings

Configure the codec settings via menu item Settings/Codec:

· Interface: IP/RTP

· Encoder dependency: Remote

· Decoder dependency: Remote

2.2. Establish Connection

Click the CONNECT button to open the Connect-dialog:

· Select interface to IP

· Select SDP/Decoder

· Check SAP

· After the SAP box is checked the list box of '#1' is updated with the currently available SAP streams; one of this SAP streams must be selected

· Click the OK-button to establish connection

7.5.4. SIP Streaming

Since system version 3.2.0.78 SIP is supported and in constant working process.

1. General

The Session Initiation Protocol (SIP) has been developed by the IETF (Internet Engineering Task Force) and is described in rfc 3261 (www.ietf.org/rfc/rfc3261.txt). This protocol can be used to establish, modify and terminate multimedia sessions and is currently used in most Voice over IP (VoIP) and Internet telephony applications.

As a client-server protocol, SIP is similar to HTTP and SMTP (email). Its requests and responses are text strings containing information about the session that is to be established. SIP addresses are composed using a syntax similar to email addresses e.g. sip:merkII@mayah.com

The complete separation of signalling and transport layer (i.e. of connection data and media data), as implemented in SIP allows for the user to establish a connection in a unified way without prior knowledge of the exact location of other participants and not depending on the nature of the transferred data. The SIP protocol can furthermore be used to let two devices auto-negotiate the parameters (e.g. algorithm, sample rate,...) of the multimedia session.

The constantly growing acceptance of SIP - due to recent developments in fields like Internet telephony and UMTS - guarantees for a steady growth and expansion of infrastructure. Since SIP supports the negotiation of bandwidth reservation and reservation is needed for good quality Internet telephony, network providers will need to deploy mechanisms for bandwidth reservation in their networks – a critical need for all professional Audio-Over-IP applications.

In addition SIP is also part of the "Next Generation Network (NGN)" as defined by the European Telecommunications Standards Institute (ETSI) and is thought to be a replacement for ISDN. Since ISDN will eventually disappear in most countries the designated successor has been appointed: SIP.

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2. How SIP works

2.1 Application Example

The above diagram shows two Centauris in a possible SIP scenario. While Centauri A is at a well known fixed location with a fixed IP address (e.g. in a control room) Centauri B is built into an OB van and therefore uses an IP address unknown to Centauri A. A direct session establishment from Centauri A to B (e.g. using a direct RTP connection) is therefore not possible.
To establish a session via SIP the first step to be taken is a registration of Centauri B with a registration server. These servers are usually located at a SIP service provider or ISP. In-house solutions (e.g. using an Asterisk Server) are also possible. By registering itself with the registration server the current IP address of the mobile Centauri is mapped to a SIP address (like sip:centauriB@mayah.com).

Now Centauri A: be can use this SIP address to connect to Centauri B. To accomplish this Centauri A first contacts a Location Server that maps the SIP address to the current IP address of Centauri B and redirects the call to this IP address. A direct session can now be established between Centauri A and B. (For a more detailed explanation of this process please see 2.2.3))

2.2 A closer look at SIP

2.2.1 Simple Session establishment

A SIP session between to clients is established using a handshake mechanism. Illustration 2 shows a simple call flow used to establish and terminate a media session. After an invitation by user agent 1 (UA1) the callee user agent 2 (UA2) tries to find the requested callee (2: 100/Trying) and indicates the incoming call to the user (2: 180/Ringing). If the user at UA2 accepts the call a “200/OK” message is sent and UA1 acknowledges the response with an “ACK” message. Now a direct media connection between the two user agents is established. In some cases (e.g. a automatic answer mode) the messages “Trying” and “Ringing” are not sent by the user agent.

A Session Description Protocol (SDP) file is appended and to messages 1 and 3 (sometimes also message 4). With the help of these SDP files the user agents can negotiate the parameters (algorithm, bit rate, sample rate) to use with the media connection. While this mechanism is suitable and well-defined for VoIP applications, where the number and parameters of algorithms are limited, it requires some further improvements in order to function with a larger number of professional algorithms.

To terminate a session, any user agent simply sends a “BYE” message which is acknowledged by a “200/OK” message from the other end. Then the session will be terminated.

2.2.3 Call Proxying

The above example of a direct SIP session between two clients is of course neither practical nor realistic. Most of the time, as stated in the example given in 2.1 intermediate servers are involved in a session establishment. One of the most common types of servers is a proxy server. If connecting through public networks a SIP negotiation will most probably involve one or more proxy servers.

The diagramm above shows what a typical call flow including a proxy server looks like. For reasons of simplicity the picture shows only one proxy server between the clients, where in most public networks there would be a chain of several proxy servers. The proxy server in this example is able to provide a location service by the means of a connection to a location server. When the proxy receives a “INVITE” message it checks with the location server to find out the current location (IP address) of the callee (UA2) and responds to the caller (UA1) with a “100/Trying” message. In a next step the server sends the (modified) “INVITE” message to the callee. A “180/Ringing” message received by the proxy server

from the callee is then forwarded to the caller. The same happens to a “200/OK” message. The “ACK” message may then be sent directly to the callee, since the caller may have learned the current address of the callee.

Please note that from the point of view of any of the involved user agents the session establishment is not differing from the simple call flow in 2.2.3). The proxy server (or servers) are completely transparent to the user agents.

3 Configuration steps on side

3.1 Codec settings

Configure the codec settings via menu item Settings/Codec:

Interface: IP/RTP

Encoder dependency: Remote

Encoder algorithm: Algorithm supported by the other side codec

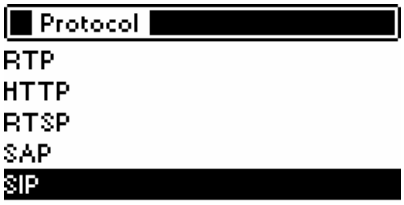
Decoder dependency: Remote

3.2. Establish Connection

Click the CONNECT button to open the Connect-dialog:

Select interface to IP

Select SIP



Type in the SIP address

Click the OK-button to establish connection

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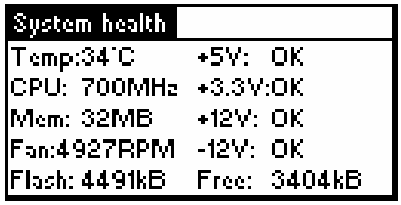
8 Troubleshooting

8.1. Monitor Device Condition

If any problems arise with the MERK II, it is recommended that you first check the device's operational data. For this purpose the device displays the operational data.



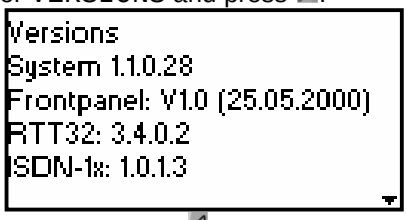
(a) Via the front panel:

Figure 72: *System monitor*

Figure 73: *Versions*

To display one of these masks, proceed as follows:

- Select the MISC option in the Start mask (see Figure 4) and press .
- Select SYSTEM HEALTH or VERSIONS and press .



- To close the respective mask again, press .

(b) Via the remote control software:

The remote control software provides a range of operational and device data displays. These can be accessed via the menu in the main window.

- Select STATUS <desired dialog window>. The following dialog windows are offered:
  - MERK II Identification; change of entry is possible;
  - MERK II Time; change of entry is possible;
  - MERK II Software Versions
  - MERK II Hardware and
  - MERK II Health; a tick in the control box means: value in permissible range. The display is not updated

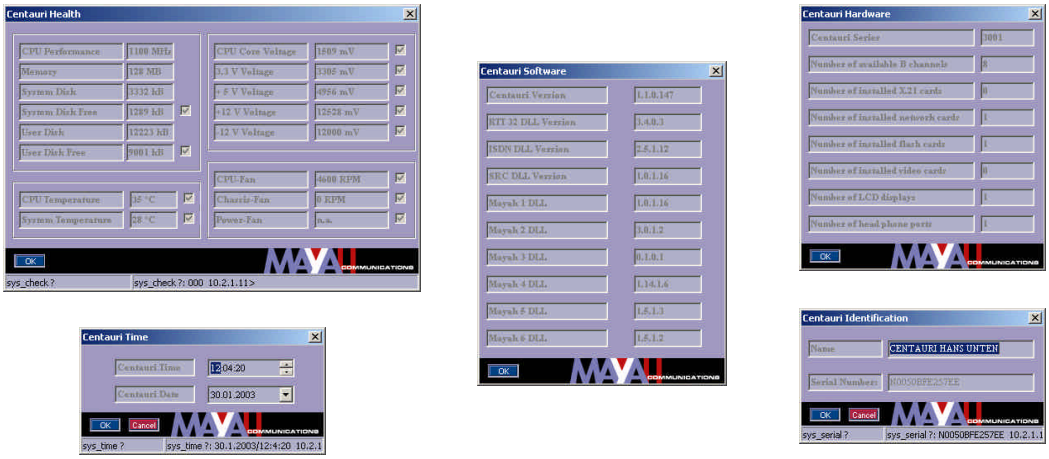


Figure 74: *Operational and device data displays*

8.2. Update Device Software

You can update your device software via ISDN, via the RS232 interface or via the Ethernet interface. If there is a connection to the internet, the current MERK II software can be downloaded into the device from the Mayah web site direct.

The update process only takes a few minutes, via Ethernet or house network (if present) only a few seconds.

Afterwards the device boots itself again automatically, and the new software is then already available.

The result is shown on the display. It can also be recognized (e.g. also by the device versions without display) by the lighting up of the LED's:

- ALARM LED flashes: 0 - 33% transmitted
- CONNECT LED flashes: 34 - 66% transmitted
- FRAMED LED flashes: 67 - 100% transmitted
- All LED's flash: Internal updating after complete transmission

8.2.1. Request of the Current Version Status

You can let the version data of the system components be displayed. To do this you should proceed as follows:

(a) Via the front panel:

- Select the `MISC` option in the Start mask (see Figure 4) and press .
- Select `VERSIONS` and press . A series of system data will then be shown on the display:

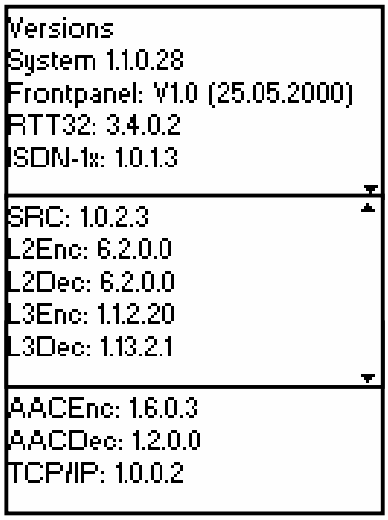


Figure 75: *System component version data*

- To end the display, press .

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(b) **Via the remote control software:** Select EXPERT CENTAURI SOFTWARE. A window opens with the desired data:

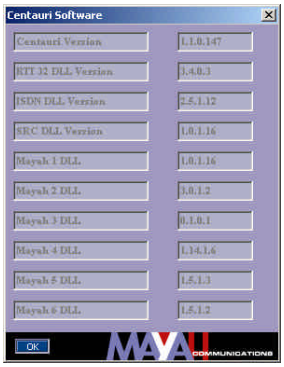

Figure 76: *System component version data*

- To close the window again, click on “OK”.

8.2.2. Software Updating via ISDN

To update the MERK II software via ISDN you must set up an ISDN connection to the MERK II server. If there is a new software version for the device that is calling, the updating routine will start when you press the key and the update file will be transmitted to your device.

To update the software via ISDN, proceed as follows:

(a) Via the front panel:

- Select the MISC option in the Start mask (see Figure 4) and press ▶.
- Select SYSTEM UPDATE and press ▶.

Figure 77: *System Update*

- Enter the ISDN phone number of the MERK II server (in Germany: 0811/ 5516-61).
- Select START UPDATE and press ▶.

  The update routine now runs automatically.

(b) Via the remote control software:

- Select EXPERT UPDATE CENTAURI VIA ISDN. A dialog window opens.
- Select the desired software version if necessary. “Newer” means that it should be updated with a newer software version than is present in the MERK II. It is of course also possible to downgrade.
- Enter the ISDN phone number of the MERK II server.
- Then click on “OK”.

  The update routine now runs automatically.

8.2.3. Updating via FTP

To update the MERK II software via RS232/Ethernet interface you have to use the remote control software. Prerequisite is that it is possible to control from the PC via IP.

- Select EXPERT UPDATE CENTAURI VIA RS232/FTP/INTERNET. A dialog window opens.
- Click on “OK”. A Windows dialog window then opens the file manager /Explorer.
- Select the desired list, then the desired software file (“*.upd”) and then click on “OK”.

  When updating via the Internet, the remote control software itself sets up a connection to the Internet via the data transmission network of the PC.

The updating routine then runs automatically. The progress of the update is displayed.

8.2.4. Updating via Internet

To update the MERK II software via RS232/Ethernet interface you must use the remote control software. Prerequisite is that it is possible to control from the PC via IP and there is an Internet connection.

- Select EXPERT UPDATE CENTAURI VIA RS232/FTP/INTERNET. A dialog window opens.
- Click on “OK”. A Windows file manager/Explorer dialog window opens.
- Select the desired list and then the desired software file (“*.upd”).
- Click on “OK”.

  When updating via the Internet, the remote control software itself sets up a connection to the Internet via the data transmission network of the PC.

The updating routine then runs automatically. The updating progress is displayed.

8.2.5. Updating via the RS232 Remote Port

To update the MERK II software via RS232Remote Port you have to use the remote control software. Prerequisite is that a control is possible from the PC via RS232.

- Select EXPERT UPDATE CENTAURI VIA RS232. A dialog window opens.
- Click on “OK” in the dialog window. A Windows file manager/Explorer dialog window opens.
- Select the desired list and then the desired software file (“*.upd”) and click on “OK”.

The updating routine then runs automatically. The updating progress is displayed.

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8.3. Remote Control Software Registry Entries

It can also be necessary to intervene in the registry directly in order to enter the MERK II's to be controlled. In such a case, proceed as follows:

- Open the group "HKEY_CURRENT_USER\Software\Mayah Communications\Centauri remote" in the Windows registry
- Create a new sub-registry with the name "IP".
- Create three new keys in the sub-registry "IP" with the names
  - Address
  - IPControl
  - Port
- If more than 1 MERK II is to be controlled, create an own key for each further MERK II to be controlled in the group "IP" in addition to "Address" with the name
  - Address1 (for the first MERK II)
  - Address2 (for the second MERK II)
  - .... etc.
- Allocate the following values to the keys
  - Address: IP Address of your momentary MERK II (e.g. "10.0.0.10")
  - IPControl: "TRUE" for IP Control and "FALSE" for RS232 Control
  - Port: '2000'

    Port 2000 in the registry has nothing to do with Port 2001 that is entered in the MERK II under "Network"! A change of one or both of these values results in communication problems!

  - Address1: IP Address of the first MERK II to be controlled
  - Address2: IP Address of the second MERK II to be controlled
  - .... etc.
- Please take into account:
  - All entries are "case sensitive". In other words, a strict difference is made between higher and lower case for all entries.
  - The IP Address must correspond to the subnetwork mask of your network.

The following entries exist:

a) HKEY_CURRENT_USER\Software\Mayah Communications\Centauri Remote
  - Baud rate: Baud rate with RS232 Remote Control
    Type: Character series
  - ComPort: Com Port with RS232 Control;
    Type: Character series, in capitals
  - MaxComPorts: Number of Com Ports to be scanned with RS232 Control
    Type: DWord, Basis: Hex
  - SuperUserPassword:
    Type: Character series

a) HKEY_CURRENT_USER\Software\Mayah Communications\Centauri Remote\Dialogs:
  - EnableDetailedLogFile:
    Type Character series, in capitals;
    TRUE = Detailed Log File
    FALSE = simple Log File
  - EnableDisconnect:
    Type Character series, in capitals;
    TRUE = Disconnect Dialog
    FALSE = no Disconnect Dialog
  - EnableHardwareStatus:
    Type Character series, in capitals;

TRUE = Hardware status is displayed at program start
FALSE = Hardware status is not displayed at program start

- EnableProgressDisplay:
  Type Character series, in capitals;
  TRUE = Progress display on
  FALSE = Progress display off
- EnableSuperUserPassword:
  Type Character series, in capitals;
  TRUE = SuperUser password request with Expert Menus
  FALSE = no SuperUser password request with Expert Menus

a) HKEY_CURRENT_USER\Software\Mayah Communications\Centauri Remote\IP

- Address:
  Type Character series;
  Current IP Address
- Address1 to Address200
  Type Character series
  IP Addresses of MERK II's still to be addressed
- IPControl
  Type: Character series, in capitals;
  TRUE=IP Control
  FALSE=RS232 Control

a) HKEY_CURRENT_USER\Software\Mayah Communications\Centauri Remote\Last Dialed Numbers

This is where the last dialed ISDN numbers are saved as a character series;

Structure of the entries: <B channel>_<order of the numbers>

Example: 2_3: 3rd last dialed number of the 2nd B channel

a) HKEY_CURRENT_USER\Software\Mayah Communications\Centauri Remote\Last IP Addresses

This is where the last dialed IP addresses are saved as a character series.

a) HKEY_CURRENT_USER\Software\Mayah Communications\Centauri Remote\Update

- UpdateAddress:
  Type Character series;
  ISDN updating number

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8.4. Remote Control Software Superuser Password

The menu items of the 'Expert' menus can only be accessed after a Superuser Password has been entered. This Superuser Password is defined when you first use the remote control software on your C for the first time. The Superuser Password can be any row of characters.

If you no longer know the Superuser Password, it is easy to find it out. It is stored in the registry under:

HKEY_CURRENT_USER \ Software \ Mayah Communications \ Centauri Remote \ SuperUserPassword.

Switch off Superuser Password Protection

You can switch off the protection provided by the Superuser Password.

- Select EXPERT OPTIONS. The following dialog window then appears:

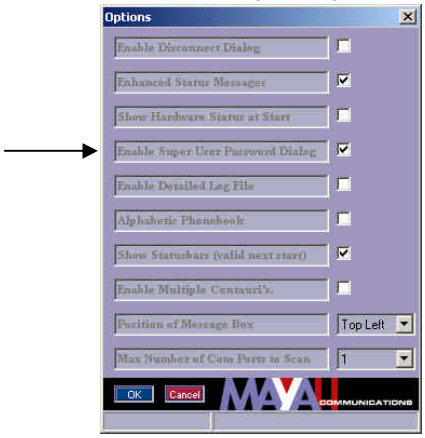

Figure 78: *The OPTIONS dialog window*

- Click on the control box beside “Enable Super User Password Dialog”, so that **no** tick can be seen there.
- To make the setting effective, click “OK”.

The password protection is now switched off.

9 Technical Data

AUDIO / MIXER	
Mic/Line	4 x symmetrical switchable XLR + 2 x Line
Mic	4X switchable +48V Phantom power with LED indication Mic Input Gain: +30dB....+67dB (controllable via menue in steps) -20dB, schaltbar 100Hz active HP filter (-12dB/Okt; 3,5 Hz= -60dB)
Line In	Impedance >25 kOhm / 600 Ohm switchable on front UEmax </= 18 dBu 2 x 25 kOhm on rear side
General	Peak Level LED indication Each Mic/Line with switchable soft limiter function (no pumping) Each Mic/Line with level and pan regulation
Monitor / Line Out	2 x [redacted]
Headphone	4 x 6.3 mm jack, 2 parallel, send and receive volume

POWER SUPPLY	external wide range power supply 97 - 235 V DC input 10 - 26 V (possible use of standard computer accessories)

CODEC	
Algorithms	G.711, G.722, Layer 2, Layer 3 Optional: apt-X, AAC, AAC-LD, MPEG 4 AAC+SBR, ADPCM4SB (compatible with AETA, Scoopy, etc.)
Compatibility	Musictaxi, APT, Zephyr, Scoopy, Prima, Glennsound, etc.

ETHERNET	ISDN
10/100 Mbit/s Interface, Wireless-LAN support RJ45 Half duplex and duplex operation TCP, UDP, Unicast, Multicast For audio via IP and remote control purposes via LAN (Windows, Browser, SNMP)	1 or 4 ISDN BRIs various international network protocols 1 or 4 RJ45 For point-to-point ISDN and Backup purposes and applications, dual codec mode, point-to-multipoint

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Glossary

AAC	Advanced Audio Coding;
Clipping level	The clipping level shows when the A/D converter overdrives. In Germany a clipping level of 15 dBu is usually used. Clipping level (15 dBu) = norm level (6dBu) + headroom (9 dBu)
FTP	FTP stands for **File Transport Protocol** and serves the processing of files in a network. FTP superimposes on the Transmission Control Protocol (TCP). The MERK II has an FTP Server that permits file access to the MERK II Flashmemory. This way, firmware updates can be installed on the MERK IIs easily and securely.
G.711	Coding procedure for data reduction; is used by all ISDN telephones
G.722	Coding procedure with a bandwidth of 7kHz (better audio quality)
HTTP	Abbreviation for **Hypertext Transfer Protocol**; works in the OSI layer 7.
H.221	A protocol with which two devices swap information about which coding procedure they master, and how the data flow is distributed in the case of several ISDN lines. An ITU (Internationale Telekommunikation Union) standard to guarantee the compatibility between devices made by different manufacturers.
IP	Internet Protocol
Multiplexing	In principle there are two different procedures for multiplexing. **The first method** compensates the time delay between two channels by transmitting and measuring a test pattern. If the connection path changes during transmission it leads to breakdowns, and it is necessary to set up a connection again. This method is called BONDING and is mainly used in the data communication field. In audio, principally by Dialog4, MusikTaxi, VP and VP-Pro. **The second method** (INVERSE MULTIPLEXING) uses a small portion of the data rate for semi- continuous checking of the delay. This method is used with J.52 and for CCS Audio Codecs, such as the CDQPRIMA for example.
ISDN	Integrated Services Digital Network; a service-integrated digital network.
J.52	Digital transmission procedure for sound programs for high quality, that use one, two or three 64 kbit/s channels for mono and up to 6 for stereo;
MPEG	“Motion Pictures Expert Group”; data format for transmission.
SMTP	Abbreviation for **Simple Mail Transport Protocol**.
SNMP	SNMP is the abbreviation for **Simple Network Management Protocol** and represents a standardized interface for the management of network devices. All the parameters of a device can be set via this interface and all statuses can be requested. These individual parameters are referred to as SNMP objects that are put together in the Management Information Base (MIB). The Merk II support this protocol optionally.
TCP	TCP stands for **Transmission Control Protocol** and organizes a secure data transfer via a network, comparable with a point-to-point

connection. Every data package that is sent from the transmitter is signed for by the receiver. If a package gets lost it will be repeated by the transmitter after a particular interval. If a package is received incomplete or faulty, the receiver requests it again.

In addition, TCP guarantees that the data packages arrive at the receiver in the same order that they were sent by the transmitter.
In MERK II, TCP is used as the default transport protocol for audio over IP. A TCP connection is always bi-directional, both encoder and decoder are activated.

UDP

UDP is the abbreviation for **User Datagram Protocol** and describes an unsecured or connectionless data transfer. UDP does not have any mechanisms for confirming data receipt, nor does it have a procedure for flow control. In other words, UDP does not guarantee that the data packages arrive in the order they were sent in.
For audio transport via IP this means that transmission security and order must be ensured by another network instance.
UDP can be activated by inserting the letter “U” in front of the IP destination address. A connection set up with UDP is unidirectional. Only the encoder on the MERK II doing the calling is activated.

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Menu Tree shown on the Merk II Frontpanel